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ORIGINAL ARTICLES.

A CASE OF SYRINGOMYELIA.

Read by Title in the Section of Neurology and Medical Jurisprudence, at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

BY WILLIAM C. KRAUSS, M.D.,
OF BUFFALO, N. Y.

Upon the invitation of your Secretary to read a paper before this Section, the thought occurred to me, to report a case of a disease as yet seldom met with in America, although its symptomatology, pathology and diagnosis seem to be well established. To convince one that syringomyelia is more prevalent in Europe than in America, one need but glance at the literature collected by Bloc or that of Buhl, or even that of Baümler, and compare the American with the European references. The cases reported by American authors, as far as I can learn, are those of Starr, Upson, Van Giesen, Booth, Jeffries, Wehlan, Shaw, Church, Hawley.

Whether this disease is actually as uncommon as reports seem to indicate, or whether it has been overlooked and placed in the category of those affections which it so closely resembles, is a question to be solved in the future. To be sure its symptomatology is so intimately allied with progressive muscular atrophy, the first stages of amyotrophic lateral sclerosis, Morvan's disease, anæsthetic leprosy, some forms of hysteria, etc., that a most thorough examination is necessary before it can be detected. On the other hand, whereas all symptoms may point toward syringomyelia, yet cases are on record where the autopsy revealed an altogether different lesion. It is therefore rather a difficult affection to diagnose, and once diagnosed, it is still more difficult to have the diagnosis verified or certified to by the pathologist.

It is not my intention to enter into a careful review of the symptomatology and pathology of syringomyelia, for I trust you are all acquainted with these facts.[1] I only wish to report a case, and the manner in which I arrived at my diagnosis.

Name, D. J. M.; age 30 years; height 5 ft. 7½ in.; weight 140 lbs.; complexion dark; constitution, large, robust, well developed; habits steady, regular, avoiding all excesses.

Antecedents.—His grandparents died of old age. His father died of cancer of the stomach, aged 52. His mother, still living, enjoys good health. He has four brothers and one sister living and likewise healthy.

Early History.—He passed through infancy and adolescence without any serious difficulty save an attack of syphilis which he contracted when 19 years old. Slight secondary symptoms appeared, which under antisyphilitic treatment disappeared without any later manifestations. At school he was bright and intelligent, interested himself in sports, was considered in strength and agility the peer of his comrades. When 20 years old, then living in Chicago, he went on the lakes as wheelman. Shortly thereafter he took to railroading, serving in various capacities as brakeman, fireman, engineer, etc. In 1886, he passed through a severe attack of rheumatism, all joints of the body being implicated. For six months he was unable to do any work. The following year, while working, he received an injury to the index and middle fingers of the right hand. In December, 1888, he was compelled to stay on his engine fifty consecutive hours. Completely exhausted he left for home, and for several days was unable to leave his bed on account of severe headache and dull aching pains along the spine. On resuming work some time afterward, he found that his strength was failing him, his arms would give out quickly, and he noticed that he could touch the hot parts of his engine without experiencing any pain. On several occasions his hands became blistered by coming in contact with the hot iron, and yet he was totally ignorant of when and where the burns were received. Soon thereafter he was compelled to stop work; his arms and hands were wasting rapidly, the muscles of the shoulders were in constant twitching, and his gait was becoming labored and unsteady. In August, 1891, after having consulted several physicians who pronounced his case rheumatism, paralysis, wasting of the muscles, etc., he decided to come to Buffalo for treatment.

Status Præsens.—I noticed nothing striking about his gait or carriage, except that he walked rather cautiously, and tried to favor his right hand as much as possible.

Psyche.—His mind was free and active, he talked intelligently on all subjects under discussion, and appeared to be very hopeful regarding the outcome of his disease.

Motility. Head and Neck.—The muscles are well developed and perform their various functions without any disturbance. The movements of the eyeballs are free, unrestricted, the iris reacts to light and accommodation. The tongue shows no deviation on protrusion.

Arms.—The right arm is perceptibly weakened so that the patient has little use of it. He is barely able to flex the forearm or to extend, pronate or supinate the hand. Flexion and extension of the fingers can be accomplished, but he is unable to pick up small objects or to button his clothes with this hand. The muscles about the shoulder joint are also weakened, and on removing his hat he is obliged to lower the head to the level of his waist. The little motion which he possesses over the shoulder comes from the levator anguli scapulæ and trapezius. The left arm is less affected than the right, although it is far from possessing the normal strength. With this arm he is still able to dress himself and attend to his wants, but he complains of its growing gradually weaker. August 1, 1891, the dynamometer gave right hand 42, left hand 48. Three days later, after the use of electricity, right, 48, left, 50. December 1, 1891, right 35, left 40. March 1, 1892, right 20, left 30.

Atrophy.—The supra- and infraspinati, deltoids, muscles of the arm and forearm are markedly atrophied; the interossei, thenar and hypothenar muscles are wasted to a slight degree. The right arm being the weaker, is naturally more affected than the left. Measurements made Aug. 1, 1891, show the size of the right and left arms respectively.

Left Upper Arm. Circumference.	Distance from Acromion.	Right Upper Arm. Circumference.
9¼ in.	4½ in.	9¼ in.
8⅞ "	7½ "	8½ "
8⅞ "	9½ "	8½ "
Forearm	External Condyle	Forearm
9¼ in.	3 in.	8⅞ in.
8⅝ "	6 "	7⅜ "
6⅞ "	10 "	6⅝ "

Hand, 8¼ in. Tip of median finger, 42 in. Hand, 8¼ in.
Circumference of chest, 9 in.; cephalad of the umbilicus, 32½ in.

December 1, 1891, another series of measurements were made:

[1] For a thorough study of the symptoms of syringomyelia, I would refer you to Prof. Rump's paper in Neurologisches Centralblatt, 1889, pp. 185, 222 and 257. For a careful, painstaking microscopical examination of the diseased cord, see Van Gleson's paper in the Journal of Nervous and Mental Disease, loc. cit.

Left Upper Arm. Circumference.	Distance from Acromion.	Right Upper Arm. Circumference.
9¼ in.	42 in.	9¼ in.
8⅝ "	72 "	8⅝ "
8⅝ "	92 "	8⅝ "
Forearm	External Condyle	Forearm
9 in.	3 in.	8¾ in.
7⅞ "	6 "	7⅞ "
6⅝ "	10 "	6½ "
Hand, 8¼ in.	Tip of middle finger, 42 in.	Hand, 8¼ in.

Circumference of chest, 9 in.; cephalad of the umbilicus, 32½ in.

Another series of measurements was made March 1, 1892, with the following results:

Left Upper Arm. Circumference.	Distance from Acromion.	Right Upper Arm. Circumference.
8⅞ in.	42 in.	8¼ in.
8⅛ "	72 "	8 "
8 "	92 "	7⅞ "
Forearm	From Ext. Condyle	Forearm
8 in.	3 in.	7¼ in.
6⅞ "	6 "	6¾ "
6 "	10 "	5⅞ "
Hand, 8 in.	Tip of middle finger, 42 in.	Hand, 7¼ in.

The electrical examinations made December 1, 1891, and March 1, 1892, show no qualitative changes whatever; the cathode closure contraction in every instance was short, sharp and quick. The only change was a quantitative one. The anode, 40 cm., was always placed over the sternum. The cathode employed was Stintzing's normal electrode (3 cm.). The readings were taken from a Hirschmann galvanometer.

Left Side.	Galvanic Current.	Right Side.
2 ma.	Radial nerve	2 ma.
1¾ "	Ulnar "	1½ "
3 "	Median " (elbow)	3½ "
2¾ "	" " (wrist)	3 "
2¼ "	Deltoid muscle	2¾ "
1 "	Biceps "	2¾ "
1¼ "	Supinator longus	4 "
2½ "	Flexor corpi radialis	4 "
3 "	Flexor corpi ulnaris	3¾ "
2¾ "	Flexor pollicis	3 "
3 "	Opponens pollicis	3½ "
3 "	Adductor pollicis	3½ "
2 "	Flexor minimi digiti	3½ "
3 (?) "	Dorsal interossei	2 "

Left Side.	Faradic Current.	Right Side.
10.5 ma.	Radial nerve	10.6 ma.
10.6 "	Ulnar "	10.5 "
9.8 "	Median " (elbow)	10.5 "
9.5 "	" " (wrist)	9.6 "
9.4 "	Ulnar " "	9.4 "
	Deltoid muscle	
12.3 "	Biceps "	12. "
11.6 "	Supinator longus	10. "
8.8 "	Flexor corpi radialis	8.5 "
10.5 "	Flexor corpi ulnaris	10. "
9.3 "	Flexor pollicis	8.9 "
9.1 "	Opponens pollicis	9.6 "
9.2 "	Adductor pollicis	9.1 "
8.7 "	Flexor minimi digiti	9. "
8.7 "	Dorsal interossei	8.7 "

Through some inadvertence, the deltoid muscles were not examined. The cathode closure contraction in every case was greater than the anode closure contraction.

The examination made March 1, 1892, under exactly similar conditions, showed no particular change. I will only add here the results obtained with the galvanic current.

Left Side.		Right Side.
2¾ ma.	Radial nerve	1¾ ma.
1⅞ "	Ulnar "	1⅞ "
3½ "	Median " (elbow)	2 "
2¾ "	" " (wrist)	1¾ "
2 "	Ulnar " "	1¼ "
3½ "	Deltoid muscle	2 "
3½ "	Biceps "	2¼ "
4 "	Supinator longus	4 "
4 "	Flexor corpi radialis	2½ "
3½ "	Flexor corpi ulnaris	3 "
1½ "	Flexor pollicis	2½ "
3 "	Opponens pollicis	2½ "
2½ "	Adductor pollicis	2 "
3¾ "	Flexor minimi digiti	2¾ "
4 "	Dorsal interossei	3½ "

I did not make an electrical examination of the lower extremities, neither did I take any measurements.

Tendon Reflexes.—The biceps and triceps tendon reflexes, likewise those of the extensors and flexors of the hand, were absent. The patellar and Achilles tendon reflexes were markedly exaggerated. Ankle clonus was present on both sides. The superficial reflexes were abolished.

Fibrillation.—Fibrillary contractions were present at intervals, especially of the deltoids. It was almost impossible to make a correct reading of the electrical examination of these muscles on this account. The body and lower extremities presented nothing worthy of attention. The spine was erect, not painful, genital organs well developed, and the muscles of the leg hard and well developed.

Sensibility.—The general or tactile sensibility seemed to be unimpaired. With closed eyes the patient responded promptly whenever the skin was touched, whether by a camel's hair brush or a blunt metallic point. He was also able to distinguish between the two. The muscular sense was undisturbed. On seeing some recent scars upon the hands, I asked the patient whence they came, but he could not say. This led me to make a thorough examination of the thermal and pain senses, and suggested to me the probable diagnosis of syringomyelia. The sense of pain and temperature were diminished over certain areas of the body and extremities. Wherever thermo-anæsthesia existed, there also would be found partial or complete analgesia. The only region of the body where this did not hold true was on the back. On the right side, from the lower border of the scapula to the thigh, there existed analgesia with loss of the sense of heat, while on the left side there was analgesia with loss of the sense of cold. The dorsum of the right arm, left hand and left upper arm, central aspect of the thighs, right arm, left hand, upper arm and left half of the body from the umbilicus to the malar bone, presented analgesia and thermo-anæsthesia.

Trophic and Vaso-motor Disturbances.—The hands were cold and cyanosed, the skin roughened, presenting here and there a vesicular eruption. The circulation in the hands was sluggish and injuries healed very slowly, leaving large, prominent scars. The palms were continually moist, and this hyperdrosis seemed to affect the whole body, especially the face. The finger nails were thickened and extremely brittle, the hair covering the hands and arms long and dense.

There were no painful spots along the course of the various nerves—in fact, no subjective symptoms, save a slight numbness about the hands. To judge whether the hands were cold or warm, the patient would carry them to his forehead and judge by the sensation of the contact. The joints of the upper and lower extremities were free, painless and not enlarged. The thoracic and abdominal viscera offered nothing abnormal. The urine was generally acid in reaction, of light specific gravity, and contained neither albumen nor sugar.

Course.—The course of the disease was rapidly progressive. On first seeing him in August, 1891, he was able to use his left hand as he chose and could assist with his right. Gradually he lost strength in both hands, despite the use of massage, electricity, etc., so that in March, 1892, he could scarcely lift them. This story is perhaps best told by the dynamometer. In August, 1891, the right hand measured 42, left 48, while in March, 1892, the right measured 20, the left 30.

The eruption and vaso-motor disturbances of the hands yielded to the galvanic brush, and when I last saw him, his hands were in better condition in this respect than before. The sphincters gradually lost power, although the vesical and anal reflexes seemed to remain intact. The legs, although not appearing to waste, were growing weaker, the gait more spastic, and his general condition poorer, so that in a few weeks he will undoubtedly have to keep his bed. Upon the urgent request of his relatives he returned to his home, and nothing more has been heard from him.

If we can judge a disease by its symptoms, and the symptoms are but the outward manifestations of the disease, then the affection known as syringomyelia must be diagnosed by certain characteristic signs and symptoms. Comparing the symptoms of my patient with those mapped out by authors and investigators on this subject, I have no hesitation in pronouncing the case in question one of syringomyelia. The cardinal symptoms, as muscular atrophy, thermo-anæsthesia and analgesia, and such secondary symptoms as trophic disorders, scoliosis and the spastic-paretic gait, are all present save one, and that scoliosis. Blocq says that curvature of the spine is an almost constant symptom, and the majority of writers have found this to be the case. I see nothing in the pathology of syringomyelia that depends upon or calls forth a spinal deformity, hence do not regard it as a necessary adjunct in the symptomatology. Cases offering all of the cardinal symptoms and some of the secondary can scarcely be denied admission into this select circle—just because it lacks one of the minor points.

The diagnosis of syringomyelia can be made with

a tolerable degree of accuracy if the patient can be thoroughly examined, and the differential diagnosis between and analogous clinical features constantly borne in mind. Diseases which have many points in common with syringomyelia are anæsthetic leprosy, Morvan's disease, multiple neuritis, hysteria, muscular atrophy and amyotrophic lateral sclerosis. Morvan's disease and anæsthetic leprosy are of such rare occurrence in America that the differential diagnosis need not be considered. Hysteria and multiple neuritis, as a rule, have very few symptoms which could be construed as syringomyelia; exceptional cases of hysteria might for a time simulate syringomyelia, but by close watching and careful examinations the counterfeit will be readily detected. The two affections which offer to the eye an aggregation of symptoms closely resembling syringomyelia are amyotrophic lateral sclerosis, especially in the early stages, and progressive muscular atrophy. The differential diagnosis of these three affections as I have met them, ignoring for the time the text-book descriptions, may be tabulated as follows:

	Muscular Atrophy.	Amyotrophic Lateral Sclerosis.	Syringomyelia.
Age	25–35	25–35	25–35.
Sex	Male	Male	Male.
Onset	Gradual	Gradual	Gradual.
Course	Progressive	Progressive	Progressive.
Muscular atrophy	Marked	Marked	Marked.
Tactile sensibility	Intact	Intact	Intact.
Sense of pain	Normal	Normal	Analgesia.
Temperature sense.	Normal	Normal	Thermoanæsthesia.
Tendon reflexes	Diminished or absent.	Exaggerated	Exaggerated.

The similarity of these affections is striking, and in diagnosing a case of syringomyelia, the verdict will depend upon the stage of the examination, as progressive muscular atrophy, amyotrophic lateral sclerosis or syringomyelia.

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A CASE OF TRANSITORY MANIA WITH PECULIAR SEQUELÆ.

Read in the Section of Neurology and Medical Jurisprudence at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

BY G. R. TROWBRIDGE, A.M., M.D.,

Fellow o' the American Academy of Medicine; Member of the American Medical Association, and N. Y. Medico-Legal Society; 2nd Asst. Physician, State Hospital for the Insane, Danville, Pennsylvania.

The following case was one that proved of especial interest to me, for the reason that I was very much puzzled as to what conditions existed to cause such a sudden and peculiar attack and the consequent train of signs and symptoms. Whether or not my title is a misnomer I do not know, and at all events it is of little importance. I shall give as full and detailed an account of the case as possible for I intend to do nothing more, but leave the comments and diagnosis to others.

Mrs. K., female; aged 47 years; married and has six children. Admitted to this hospital February 17, 1892.

Physically is a short, slight woman, 5 ft. 2 in. in height; weight between 90 and 100 lbs; dark hair and eyes; very nervous temperament. Apparently has no organic disease. The history of the case before admission is as follows: About two weeks before coming to the hospital the patient retired at night feeling as well as usual, and slept quietly until about 3 o'clock in the morning, when she was awakened by a most intense pain in the lumbar region of the spinal column, which extended rapidly upward until it reached the base of the brain and then, as she described it, "it seemed to me as if my head was splitting into a thousand pieces, and that some terrible pressure on the inside was doing it." She had scarcely time to tell her husband to go quickly for a physician, before she sank into a condition of complete unconsciousness. This increased until the woman was in an almost comatose condition; pulse between 35 and 40, respiration slow and shallow; extremities cold and body covered with a profuse, cold perspiration. With proper treatment and care she regained consciousness, and was in fairly good condition physically though greatly prostrated by the attack. In a few days abnormal mental symptoms presented themselves and she developed a number of unsystematized delusions and moreover became almost unmanageable. She conceived the idea that the neighbors in returning from an evening company came to her house bringing mattrasses and bedding with them and slept all night on the floor of her bedroom. She also showed unmistakable homicidal tendencies toward her husband and nurse and moreover endeavored to set fire to the house by upsetting a lamp. Her bodily condition all this time was considerably impaired. Such is the history of the case before her admission to the hospital. She was brought here under the impression that she was going to procure a divorce from her husband, for ill-treatment. On my first examination I found her very weak, and unable to walk or even stand alone, and this inability I ascribed at first to her apparent bodily weakness. Bowels were sluggish; appetite poor; pulse weak and over a hundred. She was rather reticent at first and would talk very little. She was put on tonic treatment and nourishing diet. The bowels were kept free by enemata, as laxative and cathartic remedies were of no avail. This fact first attracted my attention when I learned that there was no evidence of special constipation or accumulation, but there was an utter lack of power to empty the rectum. I afterwards learned that this had been the condition since the night she was taken ill. There was no difficulty in urination. After a residence in the hospital of about five days she became more communicative, and told me considerable about her illness and *that she had been in the hospital five weeks.* She did not, however, mention her delusions. I made up my mind that her inability to walk alone was not due to bodily weakness but to a paralysis of the lower extremities due to some disturbance in the brain or cord. She complained of "cold feet," and yet there was no indication of this being so. The sensation was apparently normal and the patellar reflex was somewhat increased. At this time she showed a cross and irritable disposition, and though in our convalescent ward complained most bitterly of her surroundings, food, clothes, etc., etc., and of being "locked up with a lot of crazy people."

On the morning of March 15, 1892, I found my patient in bed, and she told me she had had another slight attack of the "same pain" she had the night she was first taken ill. She was considerably worried over it, fearing she would be "very ill and this time die." Seeing a good opportunity I asked her to tell me about the attack which she had had at home which she did very accurately, her story corresponding very closely with the history I have given, except she remembered nothing for several days after the attack, and her last remembrance of anything was requesting her husband to go for the doctor. In spite of this statement, however, she remembered her delusions when they were suggested to her, and though her enmity toward her husband had diminished somewhat, she still had the delusion in regard to the neighbors sleeping on the floor of her bed-room, though she did not remember this as developing until sometime after the attack. In other words, though she recovered consciousness soon after her attack, there is a blank of several days which she cannot account for, and yet her condition was one of only an apparent attack of acute mania, as during her excitement she did things which showed she was conscious of her surroundings. She improved considerably both physically and mentally, but at the time of her discharge still clung to her strange delusion regarding her neighbors. Her husband came for her at the time she was discharged and she showed no hostility toward him. I have heard since her discharge that she is improving rapidly as I expected, for at the time she left the hospital she was

rapidly gaining the use of her limbs. Such is the case in full as far as I can give it and I shall leave it without diagnosis or comments, but I have regarded it as interesting for the following reasons:

1. The sudden advent of the attack.
2. The comatose condition following it.
3. The peculiar groundless but apparently fixed delusion.
4. The paralysis of the lower extremities and inability to evacuate the bowels.

Was there a lesion? If so, what was it, and where was it?

ADDRESS OF THE CHAIRMAN.—RESPONSIBILITY OF THE NATIONAL AND STATE GOVERNMENTS FOR THE PROTECTION OF THE PURITY OF THE WATER SUPPLIES.

Delivered before the Section of State Medicine at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

BY BENJAMIN LEE, M.D.,
OF PHILADELPHIA.

Before entering upon the consideration of the question announced as the subject of my address, to which I shall ask your attention for but a few moments, it seems fitting that a brief allusion should be made to the question of the re-organization of the parent asssociation of which this body is one of the members, in the interest of scientific work as contrasted with the transaction of routine business and the reading of essays on abstract subjects. No one who has attended the meetings of the Association with any degree of regularity for the past ten years can have failed to observe the growing importance of the Sections and the hold which they have on the interest of the members. To such an extent is this is true that a writer in the *American Lancet* has not hesitated to formulate the terse phrase "The Sections are the Association." If this be admitted the step is an easy one to the further assertion, "The Sections should control the Association." The chairman of the Section of Ophthalmology at the meeting of the last year devoted his address to indicating in what way the Sections *might* "control the Association," and courteously sent a copy of his address to the chairman of this and, it is presumed, of every other Section, if not to all the members of the Association. At the last meeting of this Section a committee of three was appointed to confer with similar committees to be appointed by the other Sections, to take up the whole subject of the development of the Sections. A place has been given in the program for the report of this committee and an opportunity will then be presented for full discussion of this important movement.

The proposal of the Chairman of the Ophthalmological Section would, as it seems to me, to a great extent do away with the Judicial Council as at present constituted, as also with the Nominating Committee, and place all the business now discharged by those bodies in the hands of a council composed of ex-chairmen of Sections for the three preceding years.

It is claimed that this plan would give the smaller Sections an equal representation in the general administration of the affairs of the Association with the larger Sections, and that the members of such a council would be thoroughly familiar with the needs and interests of the Sections. This would practically put an end to the system of geographical representation which has heretofore been warmly cherished by a large portion of the Association, and which they may feel loath to abandon. While seeing much in the scheme to approve, two objections occur to me which I feel are entitled to consideration. First, the work of the Judicial Council is often large in amount and exacting in character. The ex-chairmen of a Section are apt to be earnest workers in the Section and contributors to its program and discussions. If this labor is assigned to them, is it not possible that it may prove so engrossing as to take them away from the Section sessions, and thus diminish the interest of the latter? Secondly, eight out of the eleven Sections are composed of men who are more or less strictly specialists. Of course it is gratifying and instructive to them to meet those who are following the same lines of work, to become acquainted with them personally, to exchange ideas with them, and profit mutually by one another's experiences, efforts and discoveries. But, if only such as are thus bound together by ties of business interest, and it must be confessed after all that Section work has its business aspect to a very considerable degree, are to meet one another, listen to one another, talk to one another and eat and drink with one another, will not the effect be to increase the narrowness of the professional and intellectual horizon, which their daily routine necessarily involves, instead of broadening the view and widening the field of thought, as one would like to feel to be the result of annual association with the great minds of every branch of the profession. For this latter reason the proposal that each Section should have a stated social gathering of its own should not be too hastily adopted. The idea of having the procedings and papers of each Section reprinted from THE JOURNAL OF THE ASSOCIATION on fine paper with cloth binding would probably entail greater expense on each individual member in a small Section like ours than in a large one. It is, however, well worthy the attention of the members. And just here it may not be out of place to advert briefly to a disadvantage under which our Section labors. Nearly all its members are engaged in the active practice of medicine or surgery. The work which they do here and the time which they bestow, contribute in no way to their knowledge of the particular department of medical science or art to which they devote themselves and on which they depend for a livelihood. They know that in many other Sections papers are being read which would convey to them information of inestimable value, and discussions participated in by men to whom their ears are burning to listen. They are with us, therefore, at no trifling personal self-sacrifice. Hence, it can never be otherwise but that attendance on our sessions should be limited in members and fluctuating in character. Would it not be well to accept this fact and govern ourselves accordingly?

This thought has been in the minds of the officers in arranging the program of the present meeting, certain available periods having had no session assigned them, in order to allow the opportunity for attendance on these of other Sections.

GOVERNMENTAL RESPONSIBILITY FOR THE PROTECTION OF WATER SUPPLIES.

The question of the pollution of streams and other sources of water supply on this continent is rapidly assuming the greatest gravity. It is curious to notice

how in this, as in moral and social problems, we are gradually making the discovery that America is after all not very different from the rest of the world, and that measures which have been found necessary in the older civilizations for the maintenance of public peace, the fostering of morality and the preservation of the public health, must also eventually be resorted to by us.

The first lesson which we learned on this question was that of the possibility of the pollution of wells, and a hard lesson it was, and still is, to drive into the head of the farmer or villager, who looks upon his well or spring or pump as a sacred legacy from his ancestors, hallowed by their use for generations, and to doubt the purity of which is to cast a reflection on the character of those who have gone before. The "old oaken bucket," notwithstanding the admirable parody on it by a well known sanitarian, still holds a place in the affections of the people which wins for it the plaudits of an enthusiastic public, wherever the "Old Homestead" is put upon the stage. This idol, however, is rapidly being shattered. Next in order we have been compelled to abandon our faith in the pure mountain stream that comes sparkling and dancing down the hill-sides. Plymouth gave the death blow to this article of belief, but it dies hard. Then the cherished doctrine of the self-purification of streams in the course of a flow of twelve miles was reluctantly abandoned. Finally a careful study of the statistics of our lake cities by Dr. Peter H. Bryce, Secretary of the Provincial Board of Health of Ontario, recently presented before the State Sanitary Convention of Pennsylvania as the Annual Address before the Board, shows conclusively that large bodies of fresh water, however pure by nature, cannot be depended upon to neutralize the germs of disease poured into them by large populations. All of these dis-illusions have in turn aroused public attention to the necessity of warding off the corresponding dangers, and have thus resulted in the formulation of legislative enactments of more or less wisdom and efficiency, generally more wise and efficient as their authors have profited by the experience of foreign countries in their construction.

In other words physical nature like human nature is the same all the world over, and it only requires the presence of the necessary amount of human nature sufficiently condensed to develop invariably certain conditions in physical nature which must be heeded. We are a great people and America is a great country, but even the great American eagle must bow in humility before the universal laws of nature. The problems which are now confronting us in consequence of our rapidly increasing population have forced themselves for many years on the attention of thoughtful minds in England and on the continent of Europe.

It would be then the utmost folly not to avail ourselves of the labor and thought which they have expended upon them. As is well known, the result of such study in Great Britain has led to the establishment of a body known as the "Rivers Conservancy Commission," whose duty is to investigate the reality and extent of this alleged evil of pollution of water supplies and to devise means for its remedy. I feel convinced that such a step is rapidly becoming a necessity in this country. To marshall statistics before this Section in order to convince its members that throughout the entire nation, in villages as well as in cities, thousands of avoidable deaths are taking place every year, in consequence of the pollution of public water-supplies, or that the ratio of comparative purity of water-supplies and comparative rate of mortality is almost a constant one, would, I feel, be a work of supererogation. I take that entirely for granted and do not anticipate the expression of a doubt on the subject. The questions naturally suggest themselves, then, "What are the several State governments doing to protect the purity of public water supplies?" and "To what extent are the State governments capable of preventing the pollution of streams, many of which traverse a large number of States?" This last question is to be considered on its moral as well as physical side. For, while a State government may in the abstract possess the power to prevent the contamination of a stream passing from its territory into that of another State, in the concrete it may find itself quite unable to refute the logic of those who are interested financially in maintaining contamination. I think it will be held to be sound law that no State has a right to pollute or poison a source of water-supply passing into another State any more than an individual has to pollute or poison his neighbor's well. If this be admitted, then, if State governments fail to appreciate their responsibilities in this particular, aggrieved States will have no resource but to petition Congress to enact such legislation as will take the matter out of the hands of the State governments and place it as a question of national hygiene, in those of the national government. In order to furnish data for the commencement of the investigation of this problem, I, some few months since, formulated a brief series of questions addressed to the Secretaries of State Boards of Health as follows:

SEC'Y. STATE BOARD OF HEALTH OF

. . . . . .

Dear Doctor:—Shall I be trespassing too much upon your valuable time, if I request brief replies to the following interrogatories?

1. Has your State any laws prohibiting the pollution of streams or other inland waters?
2. Has your Board adopted any Regulation upon this subject?
3. If either or both, kindly send me copies of the same if procurable.
4. Do any streams enter or traverse your State which have become seriously polluted in other States?
5. Do any streams which have become seriously polluted in your State enter or traverse other States?
6. In your opinion is it wise or politic to attempt to preserve the purity of streams, or should we not rather allow them to be used as sewers and seek our supplies of drinking water from other sources?
7. If you favor the former alternative, do you consider it expedient, in view of the fact that so many of our streams pass from one State into another to petition Congress for the passage of a law forbidding the pollution of streams throughout the entire country, and establishing a "Rivers Conservancy Commission" for the purpose of enforcing such law?

Awaiting a reply to the above inquiries, at your convenience,

Yours very respectfully,

BENJAMIN LEE,
Secretary State Board of Health of Penn.

1532 Pine St., Jan. 18, 1892.

An analysis of the replies kindly sent by the secretaries of twenty-three Boards gives the following results:

In reply to question No. 1. "Has your State any laws prohibiting the pollution of streams or other inland waters?"

The following named States and provinces possess

general legislative enactments for the preservation of the purity of water supplies and streams or other collections of water: Kentucky, Delaware, Wisconsin, New York, Massachusetts, Minnesota, Maryland, West Virginia, New Jersey, Ontario, Quebec, Illinois, California. In all thirteen.

The following named State possesses special legislative enactments for protecting the purity of the water-supplies of certain cities only: Pennsylvania.

In the following named States and provinces the legislatures have made it the duty of the State Board of Health to protect the purity of the water supplies, and conferred upon them powers more or less complete for performing this duty: Delaware, New York, Ontario, Quebec, Minnesota, Massachusets. In all six.

The States of Minnesota and New York are those of the United States which have adopted what appear to me the most stringent and practical laws upon this subject, and time will not be lost in rehearsing their important features. That of Minnesota, founded on the original law of Massachusetts which has since been considerably modified, is as follows:

An act to prevent the Pollution of Rivers and Sources of Water Supply.—Chapter 225, Laws of 1885.

To be enacted by the Legislature of the State of Minnesota.

SECTION 1. No sewage, drainage or refuse or polluting matter of such kind as either by itself or in connection with other matter will corrupt or impair the quality of the water of any spring, well, pond, lake, stream or river for domestic use, or render it injurious to health, and no human or animal excrement shall be placed in or discharged into, or placed or deposited upon the ice of any pond, lake, stream or river, used as a source of water supply by any town, village or city; nor shall any such sewage, drainage, refuse or polluting matter or excrement be placed upon the banks of any such pond, lake, stream or river, within five miles above the point where such supply is taken, or into any feeders or the banks thereof, of any such pond, lake, stream or river.

SECTION 2. The State Board of Health shall have the general supervision of all springs, wells, ponds, lakes, streams or rivers used by any town, village or city as a source of water supply, with reference to their purity, together with the waters feeding the same, and shall examine the same from time to time and inquire what, if any, pollutions exist, and their causes. In case of the violation of any of the provisions of section one (1) of this act, said Board may appoint a time and place for hearing parties to be affected, and shall give due notice thereof, as hereinafter provided, to such parties, and after such hearing, if in its judgment the public health requires it, may order any person or corporation, or municipal corporation to desist from the acts causing such pollutions, or to cleanse or purify the polluting substance, in such a manner and to such a degree as shall be directed by said Board, before being cast or allowed to flow into the waters thereby polluted, or placed or deposited upon the ice or banks of any of the bodies of water in the first section of this act mentioned. Upon the application of the proper officers of any town, village or city, or of not less than legal voters of any such town, village or city, to said Board, alleging the pollution of water supply of any such town, village or city, by the violation of any of the provisions of this act, said Board shall investigate the alleged pollution, and shall appoint a time and place, when and where it will hear and examine the matter, and shall give notice of such hearing and examination to the complainant, and also to the person or corporation, or municipal corporation alleged to have caused such pollution, and such notice shall be served not less than ten (10) days prior to the time so appointed, and shall be served in the same manner that now is, or hereafter may be by law provided for the service of a summons in a civil action in the district court. Said Board, if in its judgment any of the provisions of this act have been violated, shall issue the order or orders already mentioned in this section.

SECTION 3. The district court, or the judge thereof, may, upon the complaint of said Board, or of the proper authorities of any town, city or village, whose sources of water supply shall be so polluted, issue an injunction to enforce the orders of said Board.

SECTION 4. Such orders of the State Board shall be served upon the persons, corporations or municipal corporations found to have violated any of the provisions of this act, and any party aggrieved thereby shall have the right to appeal to the district court of the county in which is situated the town, village or city, whose source of water supply is found to have been polluted, and such aggrieved party shall have the right to a trial by jury in the same manner as in a civil action in said court. During the pendency of the appeal, the pollution against which the order has been issued, shall not be continued contrary to the order of the State Board, and upon the violation of the order the appeal shall be forthwith dismissed.

SECTION 5. Any person, corporation or municipal corporation desiring to appeal from any such order of the State Board, shall, within thirty (30) days after the service upon him or it, of a copy of such order, file in the office of the clerk of the district court of the proper county, a notice of such appeal, together with a bond in the sum of not less than two thousand (2,000) dollars, with two (2) sureties, to be approved by the judge of said court, conditioned for the prosecution of such appeal to judgment, and for the payment of all the costs and disbursements that may be adjudged against him or it therein, and shall, within three (3) days after such filing, serve a copy of such notice and bond upon the Secretary of the Board; said Secretary shall within ten (10) days thereafter, deliver such copies so served upon him to the Mayor or other chief executive officer of any such city, village or town, whose source of water supply has been found to have been so polluted.

SECTION 6. Water boards, water commissioners, water companies and the proper officers of any city, village or town, making use as a source of water supply, of any well, spring, pond, lake, stream, river, reservoir or well, within, or partly within, this State, and distributing the waters thereof for public, domestic and general uses, shall, from time to time, and whenever required by said Board, make returns to said Board, upon blanks to be furnished by it, of such matters as may be required by said Board and called for by such blanks, and any such water board, water commissioners, water company, or officers of any city, village or town, who shall for the space of thirty (30) days after being furnished with such blanks, fail or neglect to make any such report so required, shall for each and every such neglect or failure, forfeit and pay the sum of one hundred (100) dollars, for the use of the local Board of Health, or the proper officers acting as such, of the city, town or village where such delinquent has its principal office. Said State Board shall, in the name of the State, prosecute in the district court of the proper county an action for the recovery of the penalty or forfeit therein imposed.

SECTION 7. This act shall take effect and be in force from and after its passage.

Approved March 7, 1885.

That of New York, while efficacious for the prevention of pollutions of a minor character, is hampered by a restriction in regard to the purification of sewage or alteration of systems of sewerage, which at first sight would seem to largely deprive it of value. It reads as follows:

An act to confer upon the State Board of Health power to protect from contamination, by suitable regulations, the water supplies of the State and their sources. Passed June 13, 1885; chapter 543, Laws of 1885.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

SECTION 1. The State Board of Health is hereby authorized and empowered to make rules and regulations for protecting from contamination any and all public supplies of potable waters and their sources within this State. Provided, however, any such rule or regulation shall not be operative in any county until the county judge of that county shall approve the same.

SECTION 2. The said State Board of Health shall also have power, and it shall be its duty: 1. To publish once a week, for at least six consecutive weeks, all such rules and regulations as it shall have made concerning the contamination of any sub-soil waters, spring, streams, lakes, ponds, reservoirs, or other bodies of water contributing to the potable water supply of any municipality within this State, such publication to be made in one or more newspapers published in the county in which the waters affected by such regulations are located. The cost of publishing the regulations of the State Board of Health, as above provided, shall

be paid by the corporation or municipality benefited by the protection of the water supply, concerning which the rules are made. 2. To impose penalties for the violation of, or the non-compliance with, their rules and regulations, not exceeding two hundred dollars in any one case.

SECTION 3. The officer or board having by law the management and control of the potable water supply of any municipality, in all cases where the said municipality derives its water supply in whole or in part from any subsoil water springs, streams, lakes, ponds, reservoirs, or other waters concerning which the State Board of Health shall make any rule or regulation, is hereby authorized and empowered to make such inspection of the sources of said water supply as said officer or board may deem advisable to secure the said water supply from any defilement, and to ascertain whether or not the rules and regulations made by the State Board of Health are complied with.

SECTION 4. In case such inspection shall disclose the violation by any person or persons of any of the rules or regulations of the said State Board of Health relating to the sources of said water supply, the officer or board mentioned in section three of this act shall serve or cause to be served a copy of the said rules and regulations, accompanied by a notice specifying the rule or regulation claimed to have been violated, upon the said person or persons violating such rules or regulations. If the person or persons so served do not immediately comply with the said regulation, the said officer or board having charge of the water supply of the municipality affected thereby shall notify the State Board of Health of the violation of its rules; the State Board of Health shall thereupon examine into the said violation, and if the party complained of is found to have actually violated any of the said regulations, the Secretary of the State Board of Health shall order the local board of health having jurisdiction thereof to convene and enforce obedience to the said regulation.

SECTION 5. In case any local board of health having jurisdiction thereof fails to enforce the order of the Secretary of the State Board of Health within ten days after the receipt of a notification so to do, as provided in the last section, the corporation furnishing the water supply, or the municipality deriving its water supply from the waters for the sanitary protection of which such rules have been made, is hereby authorized and empowered to maintain an action in a court of record and which shall be tried in the county in which the cause of action arose against the person or persons violating the said rules for recovery of the penalty therein provided.

SECTION 6. Every person who shall willfully violate or refuse to obey any rule or regulation made and published by the State Board of Health, and approved pursuant to the provisions of this act, shall be guilty of a misdemeanor, and on a conviction thereof shall be subject to a fine or imprisonment, or both, at the discretion of the court, such fine not to exceed three hundred dollars, nor such imprisonment six months. But the recovery of a penalty in a civil action, as provided in section five of this act and criminal prosecution and conviction under the provisions of this section, shall not be had for the same offense.

SECTION 7. When the State Board of Health shall, for the protection of a water supply from contamination, make regulations, the execution of which will require the providing of some public means of removal or purification of sewage, the **municipality or corporation owning the water-works benefited thereby shall, at its own expense, construct* and maintain such works or means for sewage disposal, as shall be approved by the State Board of Health.

SECTION 8. The State Board of Health, any local board of health, or any municipality or corporation furnishing water, may cause the affidavit of the printer, publisher, or proprietor of any newspaper publishing the rules and regulations as provided by the second section of this act, to be filed with such rules as published in the clerk's office of the county in which the municipality or corporation furnishing the water supply in any case may be situated or located, and such affidavit and rules, or duly certified copies thereof, shall be deemed conclusive evidence of due publication and of all the facts therein stated in all courts and in all proceedings or prosecutions under the provisions of this act.

SECTION 9. All acts or parts of acts inconsistent with the provisions of this act are hereby repealed.

SECTION 10. This act shall take effect immediately.

An act to amend chapter five hundred and forty-three of the laws of eighteen hundred and eighty-five, entitled "An act to confer upon the State board of health power to protect from contamination, by suitable regulations, the water supplies of the State and their sources," relative to the construction of systems of sewerage, and works for the removal and disposal of sewage and the removal of buildings, and giving a right of action for damages.

Approved by the Governor June 2, 1890. Passed, three-fifths being present.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

SECTION 1. Section seven of chapter five hundred and forty-three of the laws of eighteen hundred and eighty-five, entitled "An act to confer upon the State Board of Health, power to protect from contamination, by suitable regulations, the water supplies of the State and their sources," is hereby amended so as to read as follows:

SEC. 7. When the State Board of Health shall for the protection of a water supply from contamination, make regulations, the execution of which will require, or will make necessary, the construction and maintaining of any system of sewerage, or a change thereof, in any or for any village or hamlet, whether the same be incorporated or otherwise, or the execution of which will require the providing of some public means of removal or purification of sewage, the municipality or corporation owning the water works benefited thereby, shall, at its own expense, construct and maintain such system or systems of sewage, or change thereof, and also provide such means of removal and purification of sewage, and also such works or means for sewage disposal as shall be approved by the State Board of Health; and when the execution of any of the said regulations of the said State Board of Health will occasion or require the removal of any building or buildings, the municipality or corporation owning the water-works benefited thereby shall, at its own expense, remove said buildings and pay to the owner thereof all damages occasioned by such removal; and when the execution of any such regulation will injuriously affect any manufacturing or industrial enterprise which is not a public nuisance, the said municipality or corporation shall pay all damages occasioned by the enforcement thereof. And until such construction or change of such system or systems of sewage, and such works or means for sewage disposal, and the removal of any building, is so made by the said municipality or corporation owning the water-works to be benefited thereby, at its own expense, there shall be no action or proceeding taken against any person or corporation for the violation of any regulation of the State Board of Health under this act; and no person or corporation shall be considered to have violated or refused to obey any such rule or regulation. And the owner or owners of any building, the removal of which is occasioned or required or has been removed by any rule or regulation of the State Board of Health made under the provisions of this act, and all persons whose rights of property are injuriously affected by the enforcement of any such rule or regulation, shall have a right of action against the municipality or corporation owning the water-works benefited by the enforcement of such rule or regulation, for all damages occasioned or sustained by such removal and enforcement of the said rule or regulation or either; and an action therefor may be brought against such municipality or corporation in any court of record in the county in which the premises or property affected is situated, and shall be tried therein.

SEC. 2. This act shall take effect immediately.

In reply to question No. 2. "Has your Board adopted any Regulation upon this subject?" In the following named States the State Board of Health has either by regulation, resolution or executive action attempted to protect the purity of inland waters: Massachusetts, Connecticut, West Virginia, New York, Delaware, Kentucky, Maryland, Wisconsin, Minnesota, Ontario, New Jersey, Illinois, California, Rhode Island, Province of Quebec, Pennsylvania. In all sixteen.

In reply to question No. 6. "Is it wise or politic to attempt to preserve the purity of streams, or should we not rather allow them to be used as sewers and seek our supplies of drinking water from other sources?"

The secretaries of the following named States pro-

*Italicized by the writer.

nounced unequivocally in favor of making every effort to prevent the pollution of streams and, as far as possible, to keep all impurities from entering them. viz.: Minnesota, Wisconsin, Vermont, Kentucky, Delaware, New York, Province of Ontario, Missouri, North Carolina, Maryland, Province of Quebec. In all eleven.

The secretaries of the following named Boards doubt the feasibility or possibility of preventing pollution to a very considerable extent, and therefore declare in favor of permitting streams to be used freely and unrestrictedly as sewers, and looking elsewhere for drinking water, viz.: Alabama, Florida, Louisiana, Oklahoma Territory, Rhode Island, South Carolina. In all six.

The secretaries of the following named State Boards considered that the question could not be answered categorically, but that each case of pollution or threatened pollution should be decided upon its merits as it arises: Massachusetts, California, Illinois, Connecticut, Michigan, West Virginia, New Jersey. In all seven.

In reply to question No. 7. "If you favor the former alternative, do you consider it expedient, in view of the fact that so many of our streams pass from one State into another, to petition Congress for the passage of a law forbidding the pollution of streams throughout the entire country, and establishing a Rivers Conservancy Commission for the purpose of enforcing such a law?"

The Secretaries of the following State Boards express themselves as in favor of National legislation forbidding the pollution of streams and establishing a Rivers Conservancy Commission for the purpose of enforcing such legislation: Louisiana, Delaware, Province of Ontario, Missouri, Maryland, South Carolina, Illinois, Connecticut, Michigan, West Virginia, Wisconsin, Vermont, Kentucky, Province of Quebec. In all fourteen.

Dr. N. D. Baker, of West Virginia, says: "I would join in earnestly urging the above action upon Congress."

Dr. F. W. Reilly, of Illinois, says: "The proposition to secure a Rivers Conservancy Commission, with power, authority and means to determine individual cases on the basis of individual conditions has my hearty endorsement."

Dr. C. W. Chancellor, of Maryland, says: "I am decidedly in favor of a 'Rivers Conservancy Commission' with strong laws to prevent pollution of any water-way. The general government will be forced at an early period to enact a law to protect the water supply of Washington City, which is already greatly polluted by the States of West Virginia, Virginia and Maryland. Congress alone can remedy the evil."

Dr. R. C. Atkinson, of Missouri, says: "I heartily approve of such a measure."

Dr. P. H. Bryce, of Toronto, says: "I think the suggestion that the question of the pollution of streams be taken up as a Congressional matter should be approved of and urged by all interested in State or international sanitation."

Mr. E. B. Frazer, of Delaware, says: "I heartily approve of the above. Protect the streams, keep them as the Almighty made them."

The secretaries of the following State Boards are decidedly opposed to invoking the authority of Congress, believing that the separate States are fully capable of dealing with this problem: Rhode Island, Florida, Massachusetts, New Jersey, Minnesota, California.

It will thus be seen that the consensus of opinion of practical sanitarians is strongly in favor of legislative interference for the protection of the purity of water-supplies and streams; that in several States such opinion has crystallized into a public sentiment of such force as to compel the unwilling acquiescence of legislators and lead to the passage of laws for the purpose; that as an ideal question all regard it favorably; but that, as a practical question, the varying conditions of the several States modify the opinions of those residing therein. In some instances the drainage problems of the country are such as to make it appear almost an impossibility to prevent the pollution of streams; in others the manufacturing interests are paramount to all other considerations; and in a third class, the country is so sparsely peopled and there is such an entire absence of manufacturing industries, that the question is not with them an urgent one. Wherever it has forced itself upon the attention of sanitarians, and the difficulties are not so great as to make them appear at first sight insurmountable, but one opinion has been entertained and expressed. This being the case, is it not desirable that this Section should formulate a request to Congress to appoint a committee to consider the expediency of the establishment of a "National Rivers Conservancy Commission," and transmit the same to the Association with a recommendation for its adoption?

In coming to a decision on this really momentous question, it is in the highest degree desirable that we should allow hygienic considerations and the interests of human life alone to have weight! Shall we permit local jealousies or inherited prejudices or questions of political organization to influence us? Are not thinking men who reside in large cities beginning to wake up to the fact that so far as municipal government is concerned we have been grasping at the shadow of liberty only to lose the substance? Shall we allow the bogy of centralization of power to deter us from advocating a measure which may prove the salvation of thousands of lives?

THE NEED OF NATIONAL LEGISLATION FOR THE PROTECTION OF HUMAN LIFE.

Read in the Section of State Medicine, at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

BY A. N. BELL, A.M., M.D.,
OF BROOKLYN, N. Y.,

The need of national legislation for the protection of human life is based upon the knowledge of the transmissibility of epidemic diseases by commerce.

This need obtains to a larger degree for the United States than for any other country in the world, because while the States severally have many inherent rights and obligations of their own, and among those rights certainly that of self-protection against dangers to human life, the nation alone has the power to regulate commerce; and because, related to this commerce, the United States greatly exceeds any other country in the world as the collective centre of all nationalities and habits of life, more or less at variance with the conditions promotive of or in conflict with their own health or of the public health in this country.

Commerce, as hitherto conducted in the United States, in default of national legislation to prohibit the introduction of epidemic diseases has been and is in constant antagonism to the efforts of the States and their seaports to prevent their introduction. Hence, it may be truthfully asserted with regard to sanitary progress in this country, that it has not only been made for the most part without the aid of the general Government, but in actual contention against the Government practice in the contrary direction.

At the outset the general Government essayed to aid the seaports by providing hospitals for those sick with infectious diseases, and warehouses for infected merchandise, both of which commodities it has persistently supplied to the jeopardy of the public health and at great pecuniary cost to the people. It has fallen under my own observation that some such structures eventually became so dangerous that the people in their vicinity destroyed them; but some still exist at other seaports, memorials of the nation's efforts to coördinate the introduction of pestilential diseases with an unrestricted commerce in them. Fortunately, every State in the Union has the power to impose regulations for its own protection; and all—or as many of the States as may so agree—have the power to impose interstate regulations for mutual protection against the introduction and spread of epidemic diseases in their midst. Indeed, not only every State, but every municipality and corporate village or town, has similar power; and it has been in the exercise of such power by the corporate communities and the States severally, that, excepting the progress made in army and naval hygiene, and the work of the National Board of Health during its brief existence, all the progress in preventive medicine in this country has been made by the people in their own behalf against the fostering of disease by commerce. For this reason it is that there are not wanting some advocates of State and local sanitation exclusively as abundantly sufficient. And they would sustain the proposition by reference to the triumphs over preventable diseases by a large number of local boards of health throughout the country, particularly to the progress made under the auspices of the State Boards. Indeed, such advocates—looking at but one side of the question—might cite one of the most triumphant examples of sanitary progress on record to show the sufficiency of local effort alone when fully aroused.

It has been a favorite maxim with me for many years that progress in measures for the protection of human life primarily consists in exposing the consequences of their neglect. In 1864, six years before the first State Board of Health (that of Massachusetts in 1869) was established, I was privileged to belong to a voluntary association of citizens in New York,[1] whose members all appeared to me to be animated by the same sentiment—to seek out and publish the localizing causes of disease throughout the city. The report of the Association at the end of that year showed that, in an estimated population of 700,000, 495,592 persons lived in tenement-houses and cellars, with an average of seven and one-sixth families to each tenement-house, and that many took boarders besides. The tenement-houses of one of the most thickly populated districts contained from 10 to 50 families each. The *pro rata* of ground area to each occupant was less than 15 square feet, and the space in the apartments to each occupant less than 300 cubic feet. One half of the tenement-house population had less than 500 cubic feet of air space to each person. The filthy surroundings were loathsame in the extreme.

The total number of deaths reported for the year 1863 was 25,196—an increase of 3,952 upon the previous year; during the year 1864 there were several hundred more, and for the whole population a fraction less than one death annually to every 35 of the living.

For a period of 25 years, terminating at that time, the number of deaths reported by the City Inspector annually had fluctuated from one death to every 39 to one for every 27, and had even been as high as one to every 22½ of the whole population; while among the most overcrowded tenement-house population it was one to every 19 of the living.

The outcome of that exposure was the establishment of the Metropolitan Board, in 1866. Under it and its subsequent modifications, cellar tenements have long since ceased to exist; the air space of the tenement-houses has been enlarged, by law, to not less than 600 cubic feet for each occupant; the death-rate of the city has been reduced to an average of about 24.5 per 1000 of the whole population; and for the tenement-house population—counting in the advantage gained by an improved class of tenement-houses—the mortality has been less than among the non-tenement class, due, doubtless, to the better surveillance of the tenement-houses by the Health Department. On the whole, a reduction of about 10 per 1000 of the population annually has been made in New York City since the establishment of the first scientific Board of Health there in 1866. The result since that time, as compared with a like period preceding the awakening of public attention and subsequent legislative action—brought about by the Citizens' Association—has been the saving of more than 500,000 human lives.

Again, the quarantine at the port of New York, aided (?) in the manner before indicated, and fed by commerce, had been, like the tenement-houses of the city, getting more and more deadly—proportional with patronage—until, in 1856, it reached a climacteric period.

The Health Officer's residence was at Tompkinsville, and the boarding place and anchorage in the Narrows, between Staten Island and the Long Island shore. In this narrow channel, from opposite the northern end of Staten Island, extending southward, and including Gravesend Bay, between Coney Island and Fort Hamilton, in the immediate trend of the prevailing southwest wind toward the Long Island shore, not more than 300 yards distant, there were anchored *at one time* during that summer over 200 infected vessels, chiefly with yellow-fever. That the disease should have been communicated to the people in such proximity on the Long Island shore is perfectly consistent with the nature of such a mass of infected material everywhere. Moreover, it was through the midst of this accumulation of infected commerce that all vessels to and from the port of New York, for the time, had to pass.

But it was a blessed epidemic. It roused the people round about to the assertion of their rights, for which they did not cease to contend until the quarantine, as it was at that time conducted, was destroyed, and subsequently, by Act of the Legislature

[1] Citizens' Association.

supplanted by the most efficient quarantine establishment in the world.

It would be an easy matter to cite other scarcely less signal triumphs of sanitation in the United States, independent of the several governments, equal to any that have taken place elsewhere during the now more than forty years since I have been not an wholly inactive observer. It is with knowledge limited to such progress in sanitation by the States and smaller communities that there are not wanting some men of influence wholly opposed to national legislation for the protection of human life. If the States and many populous communities severally have such power and have used it with such good results as those illustrated by the examples cited, they ask, In what consists the necessity for national legislation?

First, because there is too much independent power on the part of State and municipal *officials*, and, above all, of merchants and their ship masters, to do as they please, regardless of sanitary knowledge, or to ignore its importance when its exercise does not happen to harmonize with the political standard set up, or to chime in with money-getting propensities at the risk of the public health.

Of these, examples are by no means wanting. As one on a small scale, but exceedingly mischievous in its direction, the port of Perth Amboy, N. J., has been a thorn in the side of the New York quarantine and a menace to the health of the city ever since it became a port of entry. It claims the right—though not in so many words—and has frequently made attempts to exercise it (and not always ineffectually, there is reason to believe), to exercise its privilege as a port of entry for infected vessels whose masters desire to shun the New York quarantine, and issuing a new clearance to New York, under the privilege of being a healthful port and a pur-blind health officer to the condition of the vessel.

But dangerous as such powers are, independent of even State control, they are insignificant as compared with some officials in higher places who would sacrifice the health of the State and nation to the opportunity for embarrassing a political opponent.

Every sanitarian in the Union knows that we have not far to seek for a prominent example in justification of these remarks; that for several years preceding the arrival of cholera infected vessels at the port of New York in 1876 the quarantine establishment of New York had been allowed to decay and become notoriously deficient in means for the protection of the public health—in the face of universal intelligence that cholera was aboard—because the Governor of the State preferred to take the risk of a cholera epidemic rather than approve of legislative appropriations for preventive measures to be applied by those who differed with him in politics.

Unfortunately, this is not an isolated case, only in so far as it is the less excusable by reason of the prominence of the official and the consequently increased danger of a following. Indeed, this is already manifest by the action of his immediate successor, who has, for professedly economic reasons, just vetoed an appropriation for completing the repairs which his predecessor was driven to undertake by Mayor Hewitt and others of New York, when the amount asked for by the quarantine commissioners to complete the work would have increased the State tax *per capita* only *the sixth of one cent.* The functions of the Health Officer of the port of New York, as with that of every other port health officer in the United States, end with each case as it arises, while the recurrence of cases is continuous, a constant tax upon the port and the State, a menace to the public health, and an unmitigated burden to commerce.

Twenty-eight years ago, at the meeting of this Association, at Boston, in 1865, I submitted a brief paper on the Introduction of Disease by Commerce. We have learned a good deal about the etiology of some commercial diseases since that time, but nothing to gainsay the force of the illustration there given, particularly with regard to yellow-fever, which is a constant menace to the southern section of our country, or of the pertinence of other infectious diseases introduced by commerce.

But that paper was evidently premature. And for that reason, fortified as it now is by increased observation and more general knowledge on the subject, an abstract of it is deemed appropriate to this occasion, as follows:

"Since yellow-fever appeared in the Brazils, about sixteen years ago" (it has now been forty-four), "it has extended over the entire Gulf of Mexico, the West Indies, and to most of the Southern States, and finally to the Pacific Coast. But all the while it has clung with tenacity to regions and localities remarkable for general resemblance—for the time being, at least—in local and climatological conditions.

"In 1851-52 the harbor of Rio Janeiro was crowded with infected vessels, many of them destined for the Pacific. How many of them arrived there still infected, and touched at places where yellow-fever soon after for the first time prevailed, we have no means of knowing. But a few have been traced.

"About the middle of the year 1851 the steamer *New World*, on her way to California, having touched at Callao after having lost almost her whole crew by yellow-fever in Rio. The steamer *Quito* also, during the same season, lost several of her crew there, proceeded to the Pacific, and arrived at Callao in April, 1852. Soon thereafter a mild form of fever broke out in Lima and along the coast of Peru, which the natives called 'pelusa,' just as in 1849 the precursory form of fever which prevailed in Rio was called 'polka.' The disease speedily developed into a perfect type of yellow-fever, and has become domiciled.

"June 6, 1865, the steamer *Ben Franklin* arrived at Norfolk, Va., from St. Thomas, where she had lain several months during the prevalence of yellow-fever, and had lost several of her crew with the disease, and had also lost two or three more with it on the voyage to Norfolk: but at the time of her arrival she had no one on board sick with it. On July 5, a man, who had been working on the boiler of the *Ben Franklin* two days before, was taken with yellow-fever, and died on the fourth day of the disease. This was the starting point of the fever, which subsequently prevailed so extensively at Portsmouth and Norfolk until the beginning of cold weather.

"Early in December, 1857, the U. S. Steamer *Susquehanna* arrived at San Juan de Nicaragua from the Mediterranean two months before, touching by the way at Genoa, Madeira and Key West. She remained at San Juan until the first of the following April, having had during the whole time she laid there a constantly increasing sick list of a precursory fever. At first intermittent, then remittent, but all recovering until March 20, when a case became malignant and died.

"The ship put to sea April 1, and on the 5th arrived off Port Royal, Jamaica, with 106 officers and men down with yellow-fever. Most of these were sent to the hospital, and on the third day afterward the ship sailed for New York, where she arrived April 15, with 51 on the sick list."

The remarkable feature in the case of the *Susquehanna* was that, at San Juan, where the yellow-fever first broke out on board, there was no yellow-fever at that place, and the disease had never been known to occur there. Moreover, the *Susquehanna* had been more than two years on service in the Mediterranean

without having had any extraordinary sickness on board when she was ordered to San Juan de Nicaragua; but she had had yellow-fever on board during her preceding cruise in the Gulf Squadron the summer before she was ordered to the Mediterranean, three years before. She was supposed to have been cleansed before she was so ordered; and owing to the unpredisposing conditions of the climate during the interval and while she remained on the Mediterranean station, to the revival of the yellow-fever infection, which, as the sequel shows, she still retained until she returned to the conditions of the yellow-fever habitat at the port of San Juan de Nicaragua.

It is contended by those who persist in their endeavors to elude every restriction upon commerce in disease by foul vessels, that there have been such improvements in ship architecture during recent years as to have well-nigh overcome such conditions as those cited. They would have us believe that because the modern iron ships and water ballast, which have taken the place of wood and stone, are more easily kept clean, they are less liable to infection than the ships of a past generation. But the continued and more certain propagation of epidemic diseases by commerce, and by emigrant ships particularly, is conclusive testimony against that contention. Indeed, admitting the improvements with regard to the passenger-carrying capacity of emigrant ships, such improvements are not infrequently found to be very decidedly in conflict with the health of the passengers, and no less dangerous to ports of arrival than were the passenger and traffic vessels of a past generation.

All sanitarians are more or less familiar with the conditions promotive of disease comprised within the tenement walls of brick vertically and longitudinally divided into compartments by hallways and partitions, pierced here and there with doors for ingress and egress, and provided with windows for light and some fresh air—by shaft or otherwise—from pavement to roof, though ever so much overcrowded. And in civilized communities everywhere the misery of people who, through poverty or other causes, occupy such unhealthful tenements, has never failed to excite public sympathy; insomuch, indeed, that in some communities, in Glasgow, for example, whole blocks of such tenements have been destroyed by national law[2] and healthful tenements substituted, with the result of reducing the death-rate among those who occupied them from 70 to 24 per 1,000.

But not so by any means with regard to the iron tenements afloat, with their several submerged floors and apartments—a basement twenty feet below the water level, with a filthy, stagnant sewer of bilge water beneath it, without a window for light or air nearer than thirty feet above the sewer, and no opening for egress or ingress except through the roof-deck, and this deck not infrequently converted into a pound for cattle. The intervening deck between the cattle pen and the steerage for emigrants is commonly divided into compartments for the mails and storage. The required air space in the steerage by law[3] is from 100 to 120 cubic feet per capita.

Below the steerage is the hold for cargo, dark and airless, except by the ekeage of the foul gases into it from the bilge, which contributes more or less foulness to the cargo according to the tightness or otherwise of the ship's lining between and the nature of cargo.

Surely it is no wonder that such tenements afloat, with no sanitary surveillance worthy of the name, should become the hatcheries of typhus-fever and other infectious and communicable diseases. The *Massilia*, by which typhus-fever was introduced into New York in January last, is an example.

Five years ago, at the meeting of this Association in Chicago, I made a report on "Medical and Sanitary Service on Board Immigrant Passenger Vessels," containing a computation of the death-rate of 27,157 emigrants who took passage to New York during the month of April, 1887. Forty-one died on the voyage—an annual rate of over 55 per 1,000, giving ten days as the average duration of the time the passengers were on board ship. The mortality was not particularly excessive for that month, and it is not believed to be in excess of the present rate.

It is the misfortune of the New York quarantine that no record of the history of infected vessels has been kept; the health officers seem to have regarded their records as personal property, and have taken them away with them. Indeed, in their published official reports even the names of infected vessels are rarely given except incidentally. The report for 1891 is an exception—at least with regard to emigrant ships. But gleaning such records as I have been able to obtain, covering the last five years, there is no difficulty in designating some of the emigrant ships as rounders with regard to their liability to infectious diseases, indicating a continuous state of receptivity. The *Alesia*, which brought cholera to quarantine in 1887, is an example. She brought small-pox twice in 1888, twice in 1890, and she has recently arrived with measles. There are several other repeaters within the same period, of two or three times each. And Dr. William M. Smith, who has occupied the post for nearly twelve years—recently relieved—informs me with regard to yellow-fever particularly, his recollection is that the disease was remarkably persistent year after year to certain vessels during the early years of his service. His report for 1889 contains this remarkable statement:

> The fact is worthy of special consideration, as illustrating the efficiency of the system adopted at this quarantine for an exclusion of yellow fever, that in no instance has the disease occurred among the passengers or crew of vessels from ports known to be infected ports; the cases that have arrived were from localities where the disease was not known to exist, and on vessels that carried clean bills of health.

It would be difficult to adduce clearer evidence than this of the persistence of ship infection and its danger, even when not directly from infected ports.

That such infected conditions of merchant vessels are no less common now than they were thirty years ago, it is only necessary to call attention to the outbreaks of yellow-fever continually occurring on board vessels in frequent communication with Rio, Santos, Guayaquil, and other yellow fever ports, in commercial intercourse with the seaports of the United States.

What is said with regard to the persistence of the yellow-fever infection in such vessels also applies to other infections and the recurring outbreaks of infectious disease on board emigrant ships—*they are not disinfected*.

My opinion, with regard to efficient disinfection

[2] English Acts of Parliament, 1866-71.
[3] Acts of Congress, 1882 and 1887.

and the means of applying it, is sufficiently well-known to require no repetition in this place. It will suffice to state that while *steam* is everywhere acknowledged to be the most efficient of all means, it is still, so far as I am informed, unused for the disinfection of vessels at our quarantine stations. At the New York establishment it has been used twice—first to the U. S. transport steamship *Delaware*, infected with yellow-fever in 1862; and second, to the emigrant steamship *Britannia*, infected with cholera in 1887—in both instances in accordance with my advice, and with complete success.

Moreover, from all I have been able to learn of common practice in the premises, no attempt is made to apply such disinfectants as are used to the bilge—the breeding place of infective germs—and but rarely the hold. The masters of infected emigrant ships have been *directed*, after permission to go to the wharves of the city and removing cargo, to disinfect the hold with sulphur or chlorine, and to wash with mercuric-bichloride solution; but I have not been able to find any one who has *seen* this done—even if it ever has been done. Is there any one who appreciates the by no means overwrought description I have attempted to give of a modern emigrant ship, who thinks that the dark and close recesses and crevices more or less common to all vessels, the special lurking places of disease germs, are ever penetrated by such means; or that the filthy paste composted by the motions of the ship, of the leakage at yellow-fever ports and bilge water with which the limbers of vessels are plastered from the keelson to the deck are ever reached by the bichloride or any other solution, or by any fumes evolved in the hold, without exposing the limbers?

But I am gratified at being able to state that Dr. Wm. T. Jenkins, the recently appointed Health Officer at the port of New York, promises the speedy application of steam to infected vessels, by which means, at a sufficient temperature to kill all disease germs without injury to the vessel, disinfection may be effectually accomplished.

While the recent laws of France and Germany against the importation of American pork obtained, no American ship laden with pork was cleared for those countries. Would it be a greater burden on France or Germany to prohibit the exportation of typhus or any other like dangerous disease thence to the United States than was the prohibition of pork from America? The solution of the question requires no argument, and it applies equally to all other countries.

The port health officers of the United States, and the Health officer of the port of New York in particular, with regard to emigrant ships, are our sole reliance; they are assumed to possess ample power for the prevention of the introduction of epidemic diseases from abroad. But so long as emigrant ships are permitted to receive passengers and their luggage without restriction; vessels known to be infected with cholera, or to have merchandise suspected of cholera infection, refused entry at English ports, but given "clean" bills of health to proceed to American ports; merchant ships to receive any sort of merchandise at the tropical ports of South America and the West Indies where yellow-fever obtains, and clear for American ports without credible bills of health—so long as any of these conditions obtain, and so long as there is no intel'igent and reliable sanitary inspection at the *ports of departure*, and for *emigrant ships*, no competent sanitary supervision *during the voyage*, just so long will the people of the United States be subject to epidemics imported from abroad.

Every person acquainted with the construction of sea-going vessels, and with knowledge of the practices of those who command them, knows that it is often wholly impracticable, under the wilful deceptions that commonly obtain among the masters and medical officers of emigrant ships, and the clearance conditions of merchant vessels generally, for health officers to obtain reliable information with regard to infectious diseases at foreign ports; the sanitary condition of the vessels at the time of clearing; their previous condition—whether recently infected or not—or the nature of any diseases that may have occurred during the voyage. Indeed, the present state of conducting commerce in epidemic diseases, by which they are so carefully concealed by those who set more value upon dollars than upon human life, is such that it is frequently altogether impracticable for the port health officer to discover their hiding places.

The only way of meeting and overcoming these dangerous conditions to the health of the people is by efficient *international* regulations, and a necessary prelude to these is a *national health service*—a service such as that contemplated by the bill of Senator Harris for a National Board of Health, introduced in the Senate, December 10, 1891.

As compared with other proposed national legislation with the same object in view:

It provides for a competent *personnel* in the organization of the Board; the utilization of the consular service of the United States as means of information; the Naval and Marine Hospital services; coöperation with State and municipal authorities; voluntary public and private associations—in short, with all sources of information relating to climatic and other conditions affecting the public health. While it makes it unlawful for any merchant ship or vessel from any foreign port to clear for any port of the United States except under clearly defined regulations for the protection of the public health, it respects the right and obligations of foreign nations to practice sanitation at the ports of departure, and—with regard to emigrant ships particularly— during the voyage. It provides against such cases as the one cited—the action of the Health Officer of Perth Amboy against the quarantine regulations of New York. It offers aid to all sanitary authorities in the United States when required, to prevent the introduction, to seek out and destroy epidemic diseases and the conditions which promote them. There is no need of pursuing the excellent provisions of this bill in further detail. I prefer to take it for granted that every member of the Section has made himself familiar with it.

One important deficiency, however, is apparent. While it provides for and exacts practical sanitation by the rightful authorities at ports of departure of foreign nations, it exacts none at our own ports; it leaves the clearance of vessels, emigrant or otherwise, proved to be infected—as was the *Massilia*—at the discretion of those who command them. A clean bill of health can be obtained from the port in such cases in the absence of prevailing epidemic disease in the city, yet the *ship* may be dangerously foul. To fill the Bill, in this particular, the Government is

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already adequately equipped—it only needs detail. The United States Marine Hospital Service, has, in default of international legislation (contemplated by Senator Harris' bill), done some excellent work through the courtesy of foreign nations—particularly at the port of Havana—to prevent the transmission of epidemic diseases thither. And, apparently, with the purpose of continued reliance upon the service of its medical officers in foreign ports, by courtesy, a bill is now before Congress to that end. But surely it must be well known to all persons conversant with the exclusive rights and practice of foreign nations, that such sanitary service is essentially unstable, ever liable to conflict with the sanitary authorities at ports of departure, and cannot be relied upon to prohibit the departure of an infected ship. The Marine Hospital Service is out of its sphere in this direction, while there is an open field for its labors in another, if the United States would set the example by practicing its own precepts—would see to it that the condition of every *vessel*, before she is permitted to receive cargo, is *clean* in a sanitary sense, and not at the mere voice of her master.

Surely it would be difficult to designate a more inviting field of labor—certainly none more germane to all that pertains to the health of mariners—than this for the Marine Hospital Service.

With such coöperation as this suggestion contemplates, under the auspices of a national board of health as provided for in Senator Harris' bill, and the international sanitary service which it would then be certain to secure, the transmission of epidemic diseases by commerce would speedily cease.

PUBLIC BATHS A PREVENTIVE OF DISEASE.

Read in the Section of State Medicine at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

BY CHARLES H. SHEPARD, M.D.,
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A nation is powerful in proportion to the health of its people, and individuals are successful in life largely in proportion to their good health. Man begins existence with a certain stock of vitality, and his success or failure depends upon a careful or prodigal use of that capital, so that good health, which should be his birthright, is of more importance than special fitness for life work.

The losses to the community from disease are beyond estimate, yet these are so common as to blunt our realization of the conditions that surround us. What more desirable therefore, than to seek some measure of relief? It is well to be able to cure disease, but a thousand fold better to prevent it. Herein lies the physician's most noble field of work, that of Preventive Medicine.

Of all forms of prevention or cure, none appeals so directly to common sense as that of baths. None are more simple, and none more powerful when rightly directed. They are inexpensive, and easily put into practice. They act upon the whole surface of the body, and as a rule are agreeable to all; for by quickening the action of the skin a more vigorous action of every internal organ and function is secured.

There are baths of many kinds, the swimming bath, the plunge, shower, douche, warm water baths, medicated baths, mud baths, and the steam or Russian baths; lately the warm water shower bath has deservedly won much favor, but for completeness of adaptation to all classes and conditions of health and disease, no bath that ancient or modern science has yet devised, is equal to the hot air, or as it is more commonly called, the Turkish bath. It is a natural stimulus, and invigorates as nothing else can. It meets all the conditions, either local or general, where any bath is indicated, more fully than any other process.

It has accomplished more as a remedy than any other one agency, and has never been known to injure, when applied by competent hands.

The action of heat, which constitutes the main feature of the Turkish bath, increases the vigor of elimination, and gives full opportunity for the destruction of poisonous ptomaines which are quickly rendered inert or thrown out entirely. The secretions are made more active, and the excretions are increased in volume and efficiency. The increased circulation promotes the discharge of old or used up tissue and the building up of new. The blood is at once a food stream and a sewage stream; for the living body is in solution in the blood, as is also the dead body that has done its work and needs to be eliminated. When it is seen that rheumatism or any other blood disease, which is acknowledged to be of microbic origin, has been quickly relieved by the action of heat, as applied in the Turkish bath, what more logical than to consider that this effect is produced through the destructive action of heat upon the microbes? Furthermore, by purifying and invigorating the circulation, it is reasonable to suppose that the normal germicidal activity of the serum of the blood and other fluids of the body is increased. This throws a hopeful light upon the future treatment of disease. No matter how certainly we may recognize disease, or how quickly we may relieve the pains and penalties of an outraged nature, if we do not thereby learn to avoid the cause, we are pursuing only an *ignis fatuus*, and the lesson of disease is lost.

The modern science of medicine made a great step forward when it came to the knowledge of the disease of the cells, otherwise called cellular pathology. Disease seems to be the result of blood poisoning. Symptoms are but an effort of nature to dislodge this poison, or obtain freedom from it. It is an interesting thought of Dr. Carpenter that cancer is an excretory organ, formed to get rid of poisons in the system. The organic matter given off from the lungs alone, and which is a deadly poison, has been estimated at thirty or forty grains a day for each adult. It is recognized that a drowned man is only a poisoned man, because the waste that is continually going on in every part of the system is of such deadly character as to destroy life in a few moments. When the eliminative functions are in any way interfered with, in so far must the man be poisoned. This is due to the formation and absorption of poisonous substances, and while the specific germ is a cause of disease, the chemical factor is even more important.

In the work of elimination, the depurative process through the skin, is equally, if not more important than that through the bowels and kidneys. Ordinary colds are best explained by the supposition that certain effete matters, which in health are normally excreted by the skin, are retained. This theory is borne out by the effects on the nervous system,

and also by the fact that the only successful methods of treatment are essentially eliminative.

To more fully elucidate this subject let us refer to the ancient history of the Turkish bath, as well as the record it has made during the past thirty years or more.

As far back as 500 years before the Christian era, Hippocrates advised the use of baths in general, and the sudorific bath in particular, for the alleviation of disease. In warm climates the practice of plunging into cold water for purposes of enjoyment and invigoration has been wellnigh universal, but the establishment of thermæ, or hot air baths, was looked upon in the first instance as medicinal, though subsequently they were resorted to as a luxury.

Celsus prescribed these baths to his patients. Martial, in a celebrated epigram, recommended the dry heat of the laconium, and also baths in the cold water of Virgin and Martian, two streams in southern Italy famed for their purity. Galen left on record directions for treating marasmus by the use of these baths.

The early Christians, who led a severe and virtuous life, regarded public baths with horror. For many centuries baths and bathing were proscribed. Michelet speaks of the Middle Ages as "a thousand years without a bath." This long period was a time of terrible epidemics. Mysterious plagues, feeding, no doubt, upon the filth of the towns, swept away myriads of people.

Mæcenas, the friend of Augustus Cæsar and of Horace, is said to have been the first who introduced warm baths at Rome, though it is probable that warm bathing was a familiar practice throughout the East long previous to this period. The Hindoos and Mahommedans make cleanliness a part of their religion, and practice what is inculcated. India, Persia and Egypt were early acquainted with the bath. The primary construction was crude, but it was reserved for the Greeks, the greatest architects of ancient times, to erect suitable buildings for public baths.

After the conquest of Greece, about 150 B. C., the Romans soon learned to imitate the example of their predecessors, and in the Augustan age, nearly coeval with the Christian era, Agrippa, the Consul, erected an enormous and splendid bath, of which one small portion, the portico, now called the Pantheon, has descended to our times in a state of excellent preservation. More than a thousand other baths were destroyed by conflagrations and by barbarians, rather than by the hand of time. The ruins of these baths are among the most wonderful monuments of antiquity. Several of them are conspicuous for their extraordinary magnitude, and the magnificence of their decorations. To these baths, consecrated to health and recreation, the Roman citizens resorted as their chief enjoyment on holidays and festivals. The bath was the club house, the café, and the restaurant, and here athletic games of all sorts were played, to give strength and vigor to the Roman people. The news of the day was sought for here, poems were recited, orators spoke from the rostrum, and minstrels sounded their harps.

The price paid for the enjoyment of all this luxury was one quadrans, their smallest coin, much less than one cent, and the Emperors would at times make the baths free, in order to popularize themselves with the people. In Turkey at the present day a large liberality is observed, every one paying according to his means; even the penniless cannot be legally excluded, if he be a Mussulman, as the bath is a religious institution among them, and every individual is required to attend it.

In ancient Rome, at the close of the third century after Christ, there were bathing facilities, including both public and private baths, for 62,800 citizens at any one time.

The earlier generations, those which made Rome the queen of the world, had always considered the bath the most important event and the most essential requirement in their everyday life, though in the course of time, and particularly after the conquest of the East, this was very much changed.

The Romans established precisely similar baths in the countries which they subjugated as they had established in their own, and they adopted a system of sanitary measures well worthy of admiration and imitation.

The occupation of Great Britain by the Romans during the first century of our era, continued for more than three hundred years. Wherever their armies were located, which was in nearly every town, extensive thermæ were built, and among the many then erected there are now to be seen the ruins of more than twenty-five in different sections of England. The most notable of these are in the cities of Bath and Chester. Fine broad roads were built across the kingdom, and thus was kept a line of communication from one station to another. Many ruins indicate the existence of villas, where the Generals and Prefects resided. Attached to the villas were the ever accompanying thermæ, both public and private. Wherever the Romans carried their victorious arms they established their laws, religion and customs.

And where now is the bath? The Romans are gone. The Roman bath is apparently lost. Mr. Urquhart, the father of the modern bath, says: "A people which knows neither Greek nor Latin has preserved this great monument of antiquity on the soil of Europe, and presents to us, who teach our children only Latin and Greek, this institution in all its Roman grandeur and its Grecian taste. The ancient Roman bath lives in its modern offspring, the Turkish hammam."

In our schools are taught the language, literature and laws of the Romans, but one of their most important customs and sanitary measures, and one which very materially served to make them the all-powerful and great people that they were, that of the bath, has been entirely neglected.

It was not till the personal experience of Mr. David Urquhart in the East led him to advocate its extension to the West that the modern movement began. In 1850 he published his book, "The Pillars of Hercules," in which he gave an account of the Turkish and Moorish baths. Six years afterward he became acquainted with Dr. Richard Barter, proprietor of a hydropathic establishent at Blarney, in Ireland. At that place they together constructed the first Turkish bath of modern times.

Gibbon remarks, "Among the innumerable monuments of architecture constructed by the Romans, how many have escaped the notice of history, how few have escaped the ravages of time! The majestic ruins of thermæ, still scattered over all Italy and the provinces, would be sufficient to prove that those countries were once the seat of a powerful and a

polite empire. Their greatness and their beauty deserve our attention, but they are rendered more interesting, inasmuch as they were erected at the public expense, and intended for public utility."

The Augustan age was an epoch conspicuous for the development of sanitary measures for the promotion of public health; it was then that a public officer of high dignity was appointed over the management of the baths.

In all the hot air baths of the ancients, as well as in those discovered as having existed in the most primitive form in various parts of the world, however striking the difference may have been as regards construction, the same principle is observed throughout. All are directed to the one great end, that of *sweating*.

In a remedial or therapeutical point of view, the hot air bath claims an attention which is being slowly recognized by the medical profession and the public, and possesses medicinal and sanitary properties far beyond the ordinary bath of warm water. This is based upon its powers of altering the chemical and electrical conditions of the organic structures of the body, and abstracting its fluids.

The work that it has accomplished since its introduction into this country, nearly thirty years ago, has proved beyond question, that there is no more powerful agent for the prevention as well as cure of all filth diseases, fevers, diphtheria, scarlatina, and even small-pox, as well as the almost universal complaints of colds, catarrh, influenza, etc.

The remarkable success of the Turkish bath in the treatment of rheumatism and all blood diseases, preeminently shows the advantage it would be to the community, were large public baths of this kind established throughout the country. With a reform in the dietetic habits of the people, and a frequent and a habitual use of the Turkish bath there is good reason to believe that rheumatism and many other diseases would be far less prevalent. "We ask ourselves," says Erasmus Wilson, "not what disease will be benefited by the thermæ? but *what disease can resist its power?*"

Every hospital, asylum, poor-house, in fact all institutions, and especially those where people are massed together, should not be considered thoroughly equipped without a complete Turkish bath.

Our people are now required to use disinfectants in many cases, but disinfectants come after disease has done its deadly work. Would it not be much more desirable, as a sanitary measure, to require the use of the bath, as a preventive of disease, inasmuch as bathing in its most complete form is the best kind of disinfectant?

We know that many epidemic and contagious diseases would be wiped out of existence by proper sanitary measures enforced in the localities where such have existed, but the culmination of all sanitary measures for the individual would be the Turkish bath.

An incident from a report published some thirty years ago, illustrates the value of the bath in the Island of Cyprus, which contained a mixed population of Mohammedans and Christians. Among the former consumption was not known; among the latter, there was from 12 to 13 per cent. of deaths from that disease.

The great value of this bath has also been thoroughly demonstrated in the treatment of defectives and incorrigibles at the Elmira Reformatory, as appears from a report by the attending physician, Dr. H. D. Wey.

We tax the industrious that we may punish those whom our neglect has made criminals and paupers; we multiply police and public house regulations; and expend large sums in hospitals, but we utterly deride the simple, and comparatively inexpensive appliance of the bath.

The conviction is irresistible that the reason of the universality of its use was because of its utility, that it possessed a healthful and curable potency, which commended it to the practical wisdom of mankind.

American and European visitors to Japan speak with admiration of the public baths of that country, that are not only kept open in summer, but are warmed and open in the winter. In the city of Tokio there are between eight and nine hundred public bathing establishments, each frequented by at least three hundred people, who pay for the privilege an extremely small sum, so small that no one is too poor to afford it. Outside of these baths the Japanese are very much given to bathing in their own houses. They are one of the cleanliest people in the world. Travelers from the Western world frequently express their regret, in describing these Japanese baths, that the progressive peoples of Europe and America have no such establishments.

John Wesley taught that "Cleanliness is indeed next to Godliness." People who are habitually clean are habitually temperate; cleanliness and temperance are twin virtues, and induce self-respect, industry and order. The cost of building and maintaining public baths, which promote cleanliness, temperance, health and morality, would be infinitely less than that of the poor-houses, hospitals, jails, and the legal machinery required therewith. If the masses of our people were given an opportunity of making a selection between the tyranny and self-debasement engendered by the saloon, and the freedom, moral exaltation, and self-respect emanating from the bath, there is little doubt that we would soon have a new order of society.

There is no more doubt of the importance of cleanliness to the person than there is of cleanliness of the streets and houses, in conducing to the well-being, the comfort and the health of the public at large, for if these are only attended to among the masses, there will be proportionally a less chance of the invasion of epidemics, which first begin with the less favored portions of the community and finally sweep all before them. It has frequently been demonstrated that the epidemics which have visited our land, had, for their breeding ground, if not for their origin, the most palpable violations of sanitary laws.

If no higher motive were to influence us, that of self-defence, or prudence, possibly fear, might stimulate us to provide against evils so formidable, which are apparently so effectually and easily guarded against by a frequent use of the Turkish bath. As one of the great sanitary necessities of the day, it is most desirable that large public Turkish baths, as a preventive of disease, should be established throughout the land, at public expense, placed under medical supervision, with admission at nominal rates, so that the poorest individual can partake of their advantages with a feeling of self-respect in paying something for the help and comfort to be derived

therefrom. They should be made more attractive than the saloon, and thus prove a more powerful antidote than any law of prohibition.

This will react on the social life of the masses. By purifying the people we would quickly purify their homes.

Heretofore this work has been left to private enterprise, but the time is fast approaching when it should be entertained on a larger scale than any thing yet attempted. The public who are to be the chief beneficiaries, should have the privilege of sharing the expense as well as the direction of such institutions.

The endowment of public baths was among the noblest actions of the Roman Emperors. Eight hundred of those institutions adorned the capital of the Empire, and they supplied, during many eventful years, almost the only medicine to a people distinguished for their corporal and mental vigor.

If prevention be better than cure, then, to found a great public bath would confer a grander blessing than to erect a hospital. To provide an institution which should bring refreshment and vigor to the overworked, healing to the sufferer; warmth, comfort, and self-respect to the victim of squalor, poverty, and neglect, would be to raise a cenotaph more glorious

"Than ever from Attic or Etruscan hands arose."

THE SANITARY SIDE OF THE DRINK PROBLEM.

Read before the Section of State Medicine, at the Forty-third Annual Meeting of the American Medical Association, at Detroit, Mich., June 7, 1892.

BY T. D. CROTHERS, M.D.,
OF HARTFORD, CONN.

Some conception of this problem may be obtained from the fact that in 1891 over eight hundred thousand persons were arrested in this country charged with being intoxicated and committing petty crimes.

It may be fairly presumed that at least half as many more, using spirits to excess did not come under legal notice. If to this is added opium, chloral, and other drug narcotics—the number reaches enormous proportions.

Practically this vast army of inebriates represents all classes and conditions who are literally withdrawn from the ranks of active workers and producers, and become obstacles and burdens to sanitary life.

They are centers of pauperism and progressive degeneration and the most unsanitary physiological and psychological conditions.

This army literally follows a continuous line of retrogression which antagonizes all evolution, growth and development, and seems to be governed by a uniform law of cause and effect, marked by a beginning development, decline and extinction, the mystery of which makes it the most absorbing scientific problem of the age.

To-day over a million workers are waging a great moral crusade to break up this evil. Politics, religion, education, the pulpit and press are combined in a struggle with this problem, approaching it exclusively from the moral side. Mediæval superstition and moral theories are urged through the pledge, prayer, persecution and punishment to explain and check this evil.

Above all this moral agitation and effort the voice of science appeals to physicians for help. This army of inebriates is increasing, and with it losses and degenerations both of individuals and the race. While inebriates are a part of the great army of the "unfit" that are "mustered out" and crowded out in the race march—there is yet unmistakable evidence that some can be halted, headed off, and returned to health.

Already science has pointed out the possibilities of cure and prevention, that give promise of practically stamping out this evil in the near future.

Some of the outline facts from the sanitary side will show its extent and the possibilities of cure from a larger and more accurate study of the subject. The great sanitary problem of to-day is the knowledge and removal of the causes of disease, and the placing of the victim under the best conditions for a return to health.

To remove the conditions which favor and encourage disease, and break up the breeding places of crime, pauperism and allied forms of degeneration is one of the future certainties of science. There are to-day over a million unrecognized inebriates who are the most defective, dangerous, and degenerate of all classes.

They are centers of pauperism and sanitary evils that pass on into the next generation entailing misery and loss beyond estimate.

The superstition of personal freedom with free will, permits this army of inebriates to go on year after year, destroying themselves, increasing the burden of their families, and building up veritable centers of physical and mental degeneration.

Nothing can be more disastrous from a sanitary and scientific standpoint than the indifference which permits men and women to use alcohol and other drugs, not only destroying themselves but entailing all degrees of degenerations on their descendents.

Sanitary science teaches that no one has a right to destroy himself and peril the health and comforts of others. The moderate and periodic drinkers are always sources of danger to themselves and others. To wait until they become chronic and degenerate into law breakers is to apply the remedy when it is too late.

Public sentiment should not permit one to become an inebriate or tolerate him after he has reached such a stage. He should be prevented and forced to undergo treatment and should be regarded as dangerous to the safety and welfare of the community and isolated until fully restored.

In the near future science will demand that every inebriate have legal guardianship and restriction of personal freedom until he recovers. When these cases realize that such restrictions will be enforced, they will seek treatment in the early stages of their disease. The teaching of science demands that both the pauper and millionaire be seized at the very onset of and forced into conditions of health and sobriety, and saved from becoming burdens on the community, and centers of ruin and misery.

The saloon and the free sale of spirits from a sanitary point is a source of extreme danger. Its influence in any community is bad. It brings sanitary perils by destroying the physical and mental stability of its patrons and both directly and indirectly favors the worst conditions of life. The saloon has no claim for recognition as a business. It is simply a parasite thriving on the decay and degeneration of

the community. It is only tolerated by the dense ignorance and selfishness of its defenders. It should be classed with foul sewers, dangerous waters and unsanitary death-dealing forces, etc.

Persecution as a moral evil keeps it alive, but examination from the standpoint of science would be fatal to its perpetuity.

The drink problem would be largely solved could the favoring conditions of saloons be changed.

Unregulated marriage, now a mere matter of accident and impulse is another source of danger perpetuating the drink-curse. Inebriates, insane, and neurotics of all degrees are permitted to propagate and transmit their defects to succeeding generations. The result is a race of neurotics that develop inebriety, and all forms of insanity and idiocy, together with all associated conditions.

The army of neurotics beyond all question reappears in succeeding generations with similar or interchangeable diseases. The inebriates of this generation who marry and raise up children are creating paupers, criminals and insane for the next. They are wrecking their descendents by crippling and incapacitating them to live healthy lives.

Every community illustrates this fact, and the drink problem is more complex and difficult of solution on this account.

We need scientific study and instruction on this point, and a public sentiment that will make marriage a question of sanitary science, then we shall have the means for practical prevention and cure of many present evils.

The drink problem has another sanitary side in defective nutrition—bad ventilation and other conditions of an unhealthy character.

Build up the physique, relieve the condition of starvation—remove the defects of unhealthy living and in many cases the tendency of the drink craze is thwarted.

Mental change—unrest and sudden change involving a strain on the organism to adapt itself to the new conditions for which it is unfit, also overwork, underwork and diseased conditions, defective and retarded growths, and nearly every kind and degree of mental and physical defect enter into the drink problem, and must be recognized and studied.

The present methods of dealing with this problem are followed by startling results.

Of the 800,000 persons who were arrrested last year for inebriety not one per cent. were benefited. Over 99 per cent. were made worse, and confirmed in their habits. The station house and jail are active recruiting places, and the hosts of inebriates who are forced into them are transformed into legions of incurables which never desert or leave the ranks.

Physically the short imprisonment of the inebriate simply removes him from spirits and leaves him less capable of leading a temperate life.

Mentally he has lost a certain self respect and pride of character essential to recovery.

The first legal punishment of inebriates is followed by a species of fatality seen in a constant repetition of the same or allied offenses.

This fact is so apparent that these cases are called "repeaters" in the courts, and the number of sentences to the same person often extends to hundreds.

In one thousand cases confined at Blackwells' Island, New York, 935 had been sentenced for the same offense, drunkenness, from one to 28 times.

The first sentence was a regular switch point from which the victim was precipitated to a constantly descending grade, becoming more and more incapacitated for temperate living.

The system of fines is equally ruinous, because it falls most heavily on the families, making it more difficult to support themselves, thereby increasing the perils of pauperism, both to the victim and those who depend on him for support.

It may be said, and the statement is sustained by many facts, that the legal treatment by the lower courts of cases of inebriety is fully as fatal as the saloons themselves where spirits are sold.

The saloon and police court are literally the school and college for the training and graduation of classes of incurable inebriates that peril every sanitary interest in the country.

The fault is not in the courts and their administration of the law, but in the laws themselves, and in that state of public opinion which urges that all inebriates should be treated as wilful criminals, and arrested and punished as such.

Thus, year after year this terrible farce of prevention of inebriety by fines and short imprisonments goes on and the incurability of the poor victims increases. Crime is increased, pauperism is increased, the most dangerous sanitary conditions are fostered, and the burdens of taxpayers and producers are increased.

The inebriate is always debilitated, and suffers from impaired brain and nerve force—alcohol has broken up all healthy action of the body.

In prison both the quality and quantity of food are ill adapted to restore or build up the weakened organism.

The hygienic influences of jails and prisons are defective in every respect, and adverse to any healthy growth of body or mind.

The psychological influences also are of the worst possible character. The surrounding and the associates precipitate the victim into conditions of mental despair from which recovery is difficult, if not impossible.

The only compensation to the inebriate is the removal of alcohol, and in this deprivation the State most terribly unfits him and makes him more and more helpless for the future.

Thus, while civilization is one of the sources from which inebriety is produced, the blundering effort to remove it by penal punishment is an actual factor in increasing and intensifying the disorder.

The treatment of inebriety from a scientific standpoint, has passed the stage of experiment and is supported by a great variety of experience and collateral evidence that cannot be disputed.

Probably the largest class of inebriates in this country are without means of support and may be termed the indigent and pauper class.

This class, non-supporting and burdensome, should come under legal recognition and be committed to workhouse hospitals, built for this purpose, preferably in the country, upon large farms and amid the most favorable environment.

These hospitals should be training schools in which medical care, occupation, physical and mental training could be applied for years, or until the inmates had so far recovered as to be able to become good citizens.

Such hospitals should support themselves in part

from the labor of their inmates, having been built from monies received from a tax imposed on liquor dealers, or a license fund, and be independent of the tax payer or of State support.

These places would receive the classes who now are sent to jail, and that other class who are neglected until they have passed into the chronic stage and have become inmates of prisons and insane asylums.

A very large proportion of these several classes could be made self-supporting while under treatment, and in many cases be an actual source of revenue. The hospitals would naturally be divided into two classes. The first would receive the better, or less chronic cases; the second would have the incurables, and those whose recovery was deemed more or less doubtful. In one case the surroundings and discipline would be more adapted for the special inmates than in the other, but the same general restraint would be followed in each.

In both recoveries would follow. A large class would be restored to society and become producers. In the second, cases would be housed and made to take care of themselves, which would be an immense gain to society in economy and safety.

Private enterprise should be encouraged by legislation to provide smaller hospitals for the better class and those who would be unwilling, or whom it would be undesirable to compel to enter public asylums. Here the commitments should be both forced and voluntary, and the restraint combined with the fullest and latest appliances of science for the end to be accomplished, blending seclusion and good surroundings to build up and make recovery possible.

The first step is to recognize the fact that the inebriate, whether continuous or periodic, has to a greater or less degree, forfeited his personal liberty, become a public nuisance and an obstacle to social progress and civilization. Second, that he is suffering from a disease which affects society and every member of the community in which he lives, and from which he cannot recover without aid from other sources, making it absolutely necessary that he should be forced into quarantine on the same principle as the small pox or yellow fever patient. This is simply carrying out the primitive law of self-preservation. Naturally, the money to accomplish this shall come from the license revenue, on the principle that every business should provide for the accidents and injuries which follow from it. Railroad companies and other corporations are required to pay damages for the accidents which follow their business, and this is conceded to be justice. But to-day the tax on the liquor traffic is used to support courts and jails where the inebriate, by fines and imprisonment, is only made worse or more incurable. Thus, literally, the business of selling spirits is increased by the almost barbaric efforts of courts and jails, and every person so punished is made a permanent patron of that business. Against this all the teachings of science and all practical study utter loud protest.

The practical success of workhouse hospitals for inebriates is demonstrated in every self-supporting jail and State's prison in the country where the obstacles are greater and the possibilities of accomplishing this end more remote. This can also be seen in asylums for both insane and inebriates, in the various sanitaria and hospitals through the country where the capacity for self-support and the curability of these cases are established facts.

More than that, these hospitals would relieve society of great burdens, of loss and suffering, the diminution of the number of the inebriates indeed become a practical certainty, the extent of which we can have no conception of at present.

It is impossible at the present time to estimate the beneficial results that would follow a systematized plan of thus housing and treating the inebriate, but there are positive indications that its effect would be felt in all circles. One of the great fountain heads of insanity, criminality and pauperism would be closed, and a new era would dawn in the evolution of science.

HINTS UPON THE PATHOLOGY OF SO-CALLED FRIEDREICH'S DISEASE, BASED UPON THE STUDY OF A SERIES OF TWENTY-THREE CASES.

Read in the Section of Neurology and Medical Jurisprudence, at the Forty-third annual meeting of the American Medical Association, held in Detroit, Mich., June, 1892.

BY SANGER BROWN, M.D.,
OF CHICAGO.

Of the utmost importance in the present condition of the subject is any addition to the stock of exact clinical and pathological data in the study of degenerative diseases of the central nervous system, for it is only by the examination of such data that a durable and reliable basis of classification can be reached for the guidance of the practitioner.

There has been such a large accumulation of recorded facts bearing upon the subject within the past few years, that the conclusions previously reached from the data then at hand, are no longer tenable.

Two broad divisions, however, may so far be safely made, one in which heredity can be demonstrated to play a prominent part, and one in which this influence is not apparent. Of the former, the so-called Friedreich's disease may be taken as a type, and of the latter the ordinary form of tabes, and unless it should be demonstrated that heredity plays an important part in the progressive form of spinal muscular atrophy, and disseminated sclerosis, the pathological process giving rise to the symptom complex, commonly described as Friedreich's disease, must, I think, at the present time, be regarded as constituting the sole instance of hereditary degenerative disease of the central nervous system. In this disease the essential pathological features are, that certain tissues have derived such a deficient vital endowment from the parent, that they undergo a more or less premature, rapid and extensive degeneration, and further, the effect of this process is mainly, if not exclusively, confined to the so-called upper nerve segment, and to the conducting filamentary process, and not the body of the cell of this segment; different cases and series of cases presenting considerable variation both in the extent, degree and period of onset of the pathological process.

That in the future there may be discovered certain laws determining the significance of certain variations, such, for instance, as whether or not the knee jerk is lost, retained or exaggerated, or whether or not there is nystagmus, optic nerve atrophy or integrity of the sphincter, is quite possible; but existing data do not, I think, render an attempt to found a classification upon these differences at present feasible.

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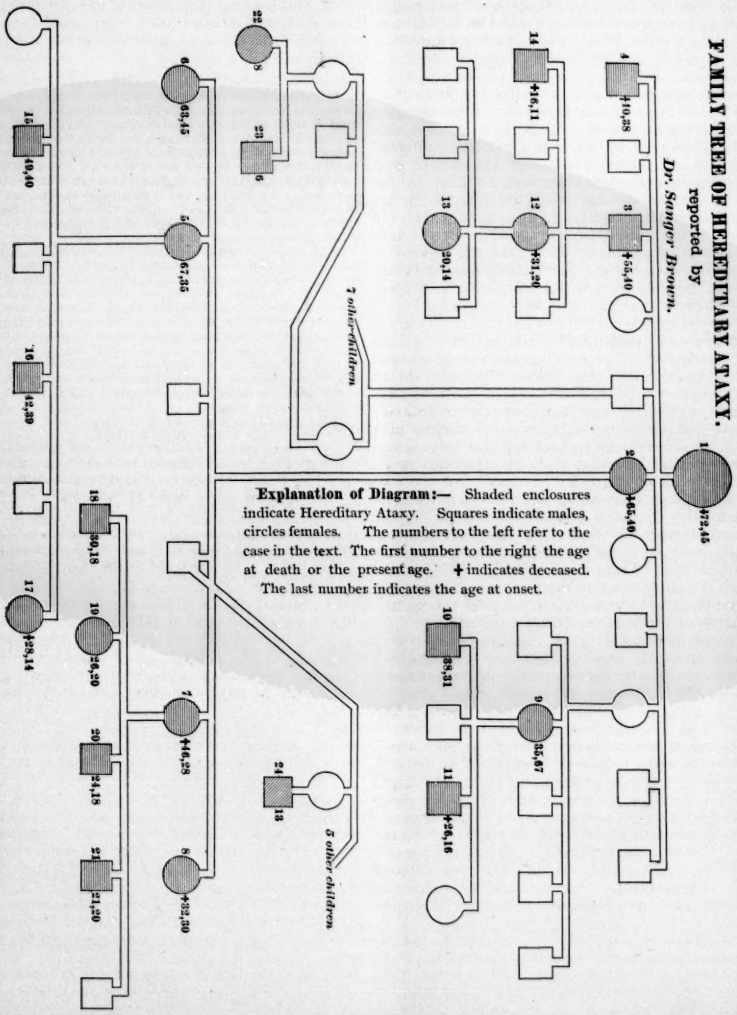
With this view of the subject, the symptom complex marked out by Friedreich in 1861, may be taken as the first link in the chain, and up to the present time the report by Tooth, of London, in 1891, of four brothers affected with spastic paraplegia without ataxy, but with affection of the voice and sphinctres, and no other important symptoms, as the last link; all other cases, including those of this series, forming intermediate links. For notwithstanding the differences existing between this series and that described by Friedreich, the heredity, the ataxy, the marked affection of the voice, would strongly suggest, if not indeed, positively demonstrate that they properly belong in the same category, and this being admitted the cases reported by Tooth should also be included, for there is as much difference almost between my series and Friedreich's, as Tooth's series and mine.


FAMILY TREE OF HEREDITARY ATAXY.
reported by
Dr. Sanger Brown.
Explanation of Diagram:— Shaded enclosures indicate Hereditary Ataxy. Squares indicate males, circles females. The numbers to the left refer to the case in the text. The first number to the right the age at death or the present age. + indicates deceased. The last number indicates the age at onset.
7 other children
5 other children

The comparative absence of the various neuroses among the relatives of the individuals composing this and other series, and among the individuals themselves, has suggested to my mind the probability that the primary defect might be rather in the

accessory than in the essential nerve elements, for it is a matter of general belief among neurologists that if hereditary defect of the nervous elements is proven to exist, this is apt to be manifested by the appearance of various neuroses in the family so affected. Here we have, indeed, marked evidence of an hereditary degenerative process affecting the nerve elements, but if the above considerations are valid, not commencing in them. This view is rather supported, also, by the consideration that the defect being transmitted in and confined to a protoplasmic cell, the whole cell ought reasonably to suffer to some extent at least, and furthermore, this view is harmonious with the assumption that the inherited defect is confined to the connective tissue cell, which is effected throughout, but inconsistent with the theory that the primary defect is in the nerve cell, for in the latter case we have to conceive of the inherited defect as being arbitrarily restricted to a mere part of a cell, to wit: the axis cylinder, and that in the face of the generally accepted belief that the nerve cell and its processes are continuous and homogeneous. Then, too, the frequency with which there is considerable jerkiness in the various movements, including nystagmus, suggests a pathological analogy between this disease, and disseminated sclerosis, in which the primary pathological process almost certainly commences in the connective tissue element; in the former the process being more general and less intense than in the latter. In disseminated sclerosis it is easily conceived how a motor nerve current may be suddenly brought up in full career, so to speak, against a sclerosed patch, and with momentary interference force its way through, and thus on to its destination with a corresponding affection of movement. In Friedreich's disease a similar obstruction, though less concentrated and arresting the current more gradually, may be hypothecated with a corresponding motor result. From the foregoing considerations I deduce the corollary that motor defects in this disease are mainly due to interference with the centrifugal paths of the upper nervous segment.

The accompanying diagram represents a series of cases of hereditary degenerative disease of the central nervous system considerably more extensive both in regard to the number of individuals affected, and the number of generations through which it has extended than any that has hitherto come under my observation. I presented essentially the same series a few months since to the Chicago Medical Society, but was then unable to present any of the cases, as I had hoped to do. I am very glad to be able to present two of the cases now, because I am well aware that where a report so extensive is made, so circumstantial, and withal, departing so widely from previous reports, as to rudely disturb, perhaps, existing theories, the skeptical might naturally be expected to mistrust either the capacity or honesty of the reporter.

I have had four of these cases (18, 19, 20 and 21) under observation over a year, and two more (9 and 10) for about nine months, and still another (22) I examined thoroughly three months since, that is since reporting the series to the Chicago Medical Society, and since that time also two cases (5 and 9) have died (and unfortunately, I was unable to get an autopsy). Two others (5 and 15) living at a distance, were thoroughly examined for me by Dr. Norman Bridge, so that in nine of the cases the examination may be regarded as fairly satisfactory.

In all the other cases I have been able to get a definite enough account of the symptoms to enable me to make a diagnosis, and this is not such a difficult matter, because when the disease is well developed it has so many prominent diagnostic features, and because the families among whom it has been distributed have been composed of people of good social position, of good education and superior intelligence.

Case No. 18.—Male, single, thirty years of age, business man of correct habits, with an excellent family history aside from this disease, the hereditary relations of which are readily seen by reference to the chart. With the exception of the effects of the disease now under consideration, the general health has always been good, and the patient, from his childhood up, showed more than an ordinary degree of bodily and mental vigor, but these characteristcs were judiciously directed,so that they do not appear to have had any etiological bearing upon his case, and I merely state them so definitely in order to make it clear that in his case, at least, development was normal.

In this case, as in many others of the same kind,the symptoms developed so insidiously, that it is impossible to fix upon a very exact period as marking the onset of the disease. The patient thinks, and this opinion is shared by some members of his family, who, like himself, have made a close study of the subject, that at the age of puberty there was a greater affection of the voice than could fairly be attributed to that physiological phenonenon alone; and it is quite certain that at eighteen he could not walk steadily when fatigued, and would communicate a perceptible movement to any moveable object against which he might happen to support himself.

Weakness did not appear in the legs until several years later, and it has always been distinctly subordinate to the ataxy. Ataxy did not appear in the arms until about three years after making its appearance in the legs. An increase in the knee jerk was an early symptom no doubt, because quite early in its course the disease was pronounced spastic paraplegia by experienced and eminent physicians. A troublesome tendency to choke was a comparatively early symptom, and this has continued down to the present time. There have been no sensory symptoms of any kind, no affection of the sphincters, and no muscular atrophy or trophic disturbance, and no disorder of the sexual functions. For the past year the body weight has been about stationary, but for several years prior to that there had been a gradual decline amounting to about twenty pounds.

The ataxy, impairment of vision (of such a character that patient could read best in a dim light), difficulty in articulation and weakness have gradually increased, sometimes more and sometimes less rapidly, for the past thirteen or fourteen years, until the patient has reached his present condition.

The patient cannot walk without the assistance of another person, and all the time has a marked subjective feeling of insecurity, as if his head must certainly fall violently to the ground. There is distinct weakness of the legs, but I know of no good way of exactly estimating its degree. The knee jerk is much exaggerated, and equal on the two sides, and there is ankle clonus. The skin reflexes appear normal, excepting the cremasteric, which is perhaps subnormal. There is marked ataxy in all voluntary movements, and there are associated movements extensive in range and distribution. Thus, for instance, a voluntary movement of the hand and arm often sets up associated movements in the opposite hand, the head and face. There is ataxic disturbance in the muscles concerned in articulation, including the tongue, with corresponding defect of speech.

There is marked impairment of vision, due to optic nerve atrophy, vision being 20-200. There has been diplopia at times of a few days' duration. There is ptosis when the patient is at rest, but the lids are often voluntarily raised so high as to show the sclerotic above the iris. There is lagging of the right external rectus to the extreme right, but no incoördination in the external ocular muscles, and no nystagmus. The pupils respond to light, accommodation and stimulation of the skin of the neck, but more slowly than normal. There is not much peripheral limitation of the visual field, but there is almost complete color blindness, red only being distinguished with any degree of cer-

tainty. Closure of the eyes has no material effect upon the ataxy.*

Case 20.—Brother of 18. Age 25, business man of correct habits, and during boyhood a frequent winner of prizes in athletic contests. Excepting that the disease appeared later, has advanced less rapidly, and that the range of tissues involved is more limited, the history of Case 18 may be used for this one. The tendency to choke is absent, and though the first symptom appeared at 18, the arms are not yet much affected.

Here there is marked ataxy in the legs, as shown in the gait, but it would be difficult to demonstrate weakness. The ataxy is not much increased by closure of the eyes, and as already stated, the arms are not yet much involved, and neither have associated movements appeared to any considerable extent. The vision is reduced considerably, and is much better in a dim light than in a bright one, but one would hardly make a diagnosis of optic nerve atrophy from an examination of the disc alone. There is ptosis at rest, and the lid is often raised too high by voluntary effort, but there is no nystagmus. There is obvious, but not great, impairment in articulation.

In *Cases 10 and 17* there appears to have been something like lightning pain, not severe, however; and in 10 there is considerable insufficiency of the rectal and vesical sphincters, though in every other respect the case is practically the same as 18. I might add, too, that in Case 18, during the last months of life, there was marked melancholia, with great emaciation.

Case 22 is a rather backward girl of 8, whose parents at the age of 5 first noticed a tendency to walk upon the toes, which has steadily increased, so that at the date of my examination, there was observed some permanent spastic contracture of the right leg at the knee, with ankle clonus on that side, and greatly exaggerated knee jerks on both sides. No atrophy, ataxy or apparent weakness, and no disturbance of sensation.

For a more complete report of the whole series I must refer to the February number of this year of the *North American Practitioner* and the *Chicago Medical Recorder*, from which it will appear, I think, that Case 18, as here described, with the exceptions here noted, is fairly typical of the series.

Discussion.

Dr. C. K. Mills, Philadelphia, Pa.:—These cases are of great interest, and particularly the part of the paper of Dr. Brown which gives us his view as to the pathology of the disease. Friedreich's ataxia, and a series of cases of a different sort have, I think, a certain bond in common. It is one of the most interesting matters in connection with the discussion of these cases to recognize this bond of union. We have in the wards at the Philadelphia Hospital cases of Friedreich's ataxia, and half a dozen other forms of disease which, I believe, are all hereditary; for instance, the so-called hereditary chorea, idiopathic muscular atrophy, and the association of muscular atrophy with pseudo-hypertrophy, etc. We have had, in my own personal experience also, a few cases of ordinary spastic paraplegia, and of the ordinary type of locomotor ataxia which were, in so far as the history is concerned, hereditary. A most interesting case is a young man, 26 years old, who presents a typical case of the ordinary form of locomotor ataxia, with lancinating pains, disorders of sensation, with ocular and bladder symptoms, etc. In this case the disease began at the age of 14 years. Cases of combined sclerosis or ataxic paraplegia occasionally begin early in life. We should learn to take a more philosophical view of these cases, and while we differentiate more and more the nervous diseases into types, we should be careful not to lose sight of the bond which connects them. A large number of them are due intrinsically to the same tendency to arrest of development. To many of the forms of hemiplegia and spasmodic affections of children these same remarks may apply.

As to the pathology of the disease, I think the views advanced by the author of the paper are of the greatest interest. Dr. James Hendrie Lloyd, of Philadelphia, and others maintain that there is a similarity between cases of Friedreich's ataxia and syringomyelia. Dr. Lloyd believes that if the cases were closely studied a certain percentage of them would be found to be cases of syringomyelia. In a tabulated report by Dr. Crozier Griffith of some 150 cases, a few of the autopsies indicate the pathology to be of this character. In several cases supplementary central canals were apparently present, as well as enlargements of the original canal; or the canal itself was patulous, which, of course, is not the case as a rule.

Dr. F. X. Dercum, Philadelphia, Pa.:—I have seen a number of cases present typical Friedreich's ataxia in which there was loss of knee jerk. We have in our wards in Philadelphia a patient in whom a similar degenerative change in the cord doubtless exists, but with the ataxia there is also associated marked chorea. Whether we have at the beginning a clear understanding of the cases of adult and hereditary chorea is a question, but certainly the facts at hand are very suggestive.

*Dr. W. T. Montgomery and Dr. Casey A. Wood examined the eyes and made report.

A CASE OF ABDUCTOR PARALYSIS OF BOTH VOCAL CORDS.

Read before the Section of Laryngology and Otology, of the forty-third annual meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

BY JONATHAN WRIGHT, M.D.,
OF BROOKLYN, N. Y.

The report of the following case is made more with a hope of helping to keep alive an interest in a puzzling subject than with a hope of adding anything entirely original to its literature.

K. T., maidservant, æt. 26, single, came for treatment to the throat class of the Out-Patient Department of Roosevelt hospital on Dec. 29, 1890.

Her family history was negative. She had a moderate alcoholic, but no specific history. Four years previously she began to have almost constant headache. She had pain in the bones and felt weak. She had shortness of breath and palpitation of the heart on exertion. She had some swelling of the feet and hands. At that time she was treated in the hospital under the diagnosis of simple anæmia. She had had similar symptoms since then but had kept at work. The previous winter she had considerable cough and expectoration. She had been run down since summer, and unable to work. For two months she had had cough and expectoration of phlegm. Five weeks before she had fallen in a faint and was totally unconscious for several minutes. A few days later her neck began to feel stiff and numb at the back. She had also numbness and dull pains in the right arm, side and leg, and she limped a little. Three weeks before admission she began to have some choking on swallowing. She felt as though there was something in her throat or behind it. There was no pain, but a deep seated numbness. A week later she began to make considerable noise at night in breathing. She had little or none of this when awake. She suffered some dyspnœa only on exertion. The feet had been a little swollen. She complained of no eye symptoms. She had a little headache. The numbness had grown less. She had some cough. Her appetite was poor. Her bowels were regular and her menstruation was normal. She was sent to the wards of the hospital. Her condition on admission, as noted in the history books of the clinic and the hospital, was as follows:

"She is fairly well nourished; her face is rather sallow and a little pale. When awake her breathing is audible at the bedside, but not loud. It is somewhat stridulous in character. She had some difficulty in talking at times. She seems to phonate, at those times, on inspiration rather than on expiration. This is especially so after a laryngoscopic examination. P. 74, R. 22, T. 99.

"A physical examination of chest show signs of a general bronchitis, especially on the left side. There is some curvature of the spine, with the convexity to the left in the upper dorsal and lower cervical region. There are no points of tenderness. She said she had been so from a child.

"Urine, acid, 1013, albumen faint trace; a few pus cells; no sugar.

"Laryngoscopic examination. The left vocal cord is immovable in the median line. The right vocal cord moves in abduction only throughout about one-third of its normal arc, so that in greatest abduction there seems to be only about one-eighth of an inch between the two vocal processes of the arytenoids. Both cords seem tense (but this is a condition I am never absolutely sure of, the degree of tension varies so much normally in different cases)."

She had noisy breathing at night more marked on inspir-

ation, but also on expiration. She also seemed to have some dyspnœa at night.

She was very hysterical and it was very difficult to separate her real symptoms from her imaginary ones in the accounts she gave of them.

Her cough and expectoration soon ceased under treatment directed to her bronchitis. She was also put on anti-syphilitic and anti-hysterical treatment with no beneficial result. There was no change in the laryngeal symptoms, either subjective or objective.

Her general health improved very much and she gained a great deal of flesh.

She was finally discharged April 29, 1891, after having been under observation for three and a half months in the hospital. She came again to the Out-Patient Department and I gave her one-sixth of a grain of sulphate of strychnia daily for ten days or a fortnight, with no effect.

On August 19, 1891, she was again admitted to the hospital for a sudden attack of dyspnœa which promptly passed away. She was again discharged two days later. After this she had from time to time attacks of dyspnœa complicated with hysteria and flatulence until April 29, 1892, when she suddenly died from suffocation. During the latter part of the time she was under the care of Dr. H. B. McCarroll, to whom I am under obligations for that part of her history. On the day she died I had an appointment with Dr. McCarroll for a consultation, with the idea of suggesting a thyrotomy and the excision of her vocal cords, having become convinced that otherwise she would die in one of her attacks, although none of them had been alarming. To our great disappointment we were unable to obtain an autopsy and so the case is robbed of much interest and probable instruction.

Three years ago, while interested in some cases of laryngeal paralysis, I reported two of them and gave a summary of the literature of the subject up to that date.[1]

The report of this case may serve as a text for a few remarks upon some experiments made in the last few years which have shaken some of my convictions, never very decided, in regard to the subject.

Although Burger,[2] in a recent very valuable monograph, has reported some cases of tabes dorsalis which very closely resembled the one reported here, I cannot believe that there was in this case any real posterior spinal or bulbar sclerosis, as the laryngeal "crises" were the only ataxic manifestations of the disease.

To quote from my former paper:

"Baümler and Johnson in 1872 and 1873, and later McCall, Anderson and Whipham reported cases of bilateral paralysis of the vocal cords, some of them in the median position, which were due to pressure on one vagus nerve alone. Johnson in another and a very able paper, explained this phenomenon on the strength of the researches of Rosenthal, and Waller and Provost, which were repeated by Professor Rutherford at Johnson's instance. Pressure on the trunk of the vagus may cause bi-lateral palsy, or spasm of one and palsy of the other side of the larynx, by reflex action due to the decussation of the nerve fibres in the medulla, since the vagus is made up of both afferent and efferent nerve fibres, while pressure on the recurrent alone can only cause paralysis of the affected side. This he believed to be the cause of many cases of sudden dyspnœa in thoracic aneurism. Finally he says, 'it is probable that the long continued irritation of the trunk of the vagus may gradually, as in cases of traumatic tetanus, induce such demonstrable structural changes in the nerve centre, as will explain the bilateral palsy which appears to be one of the results of chronic nerve irritation.'"

1 New York Medical Journal, September 28, 1889.
2 Die Laryngealer Störungen der Tabes Dorsalis. H. Burger, Leiden, 1891.

In the case here reported the curvature of the spine in the lower cervical region with the convexity to the left, would suggest that the body or lateral process of a cervical vertebra might press upon the left vagus nerve, or upon the left recurrent nerve. Krause[3] has recently published experiments which prove that the recurrent nerve contains centripetæ as well as centrifugal fibres.

Three years ago it seemed to me that the experiments of Krause, Jeleneffy and others made it more than probable that the median position of the cords in these cases was due to laryngeal spasm caused by irritation from pressure upon the nerve trunks or centres. It certainly seemed very improbable, *a priori*, to think that pressure upon the recurrent nerve, which carries both abductor and adductor nerve filaments should select in so many cases the former for injury. Knowing as we do that the abductors all over the body are the weakest, and that electric stimulation of the recurrent nerves causes contraction of both adductors and abductors, resulting in adduction of the vocal cords, we were prepared to give ready credence to Krause's theory, supported by his experiments, that pressure upon the recurrent nerve causes closure of the glottis by stimulation of all the nerve filaments rather than by paralysis of the abductor filaments alone.

Since then, also, Masini[4] has shown that crystals of chromic acid placed on the recurrent laryngeal nerve of a dog causes tension and immobility of the vocal cord of that side in the middle line. Fränkel and Gad,[5] on the other hand, had shown that gradual freezing of the recurrent laryngeal nerve, which we know decreases nerve irritability, causes also immobility of the vocal cord in the median position. Similarly contradictory are the experiments of Wagner[6] and Katzenstein.[7] The former showed that the median position of the vocal cords is due to the action of the crico-thyroid muscle, which he claims acts as an adductor of the vocal cords as well as a tensor, and being supplied by the superior laryngeal, is not affected by injury or disease of the recurrent laryngeal nerve.

Katzenstein's experiments, on the other hand, demonstrate quite as conclusively that this is not the case.

The most severe blow yet dealt experimentally to Krause's spasm theory with which I am familiar, is contained in the recent work of Dionisio.[8] He very ingeniously adapted a thin rubber bag to the glottis of a dog, between the vocal cords, and by connection through a rubber tube with a graduated scale constructed a laryngeal manometer by which he could read the degree of compression exerted on the column of water by the abduction and adduction of the vocal cords. He noted the oscillations of the column of water during natural expiration and inspiration.

He then exerted gradual homogeneous and concentric pressure on the recurrent nerve.

He observed, "that according as the duration and intensity of the compression of the nerve increased, the inspiratory and expiratory oscillations of the manometric column decreased; moreover the latter was little by little lowered several centimeters." He

3 Krause: Berl. Klin. Woch., No. 20, 1892, refers also to similar experiments by Burkhart.
4 Masini: Archivii Italiani di Laringologia. Amro XI, 1891, fasc. 1.
5 Fränkel and Gad: Centralb. f. Phys., 1889, H. 3.
6 Wagner: Virchow's Archiv., 1890, B. 120, H. 3.
7 Katzenstein: Virchow's Archiv., 1892, B. 128, H. 1.
8 Dionisio: Archivii Ital. di Laryngologia, fasc. 1, 1892.

then compared the results of electric stimulation with those of compression, and concluded that: "Gradual and continuous pressure exerted upon the inferior laryngeal nerve, in place of augmenting the force of adduction of the vocal cord diminishes it. The force with which the cord was adducted in consequence of the slightest electric stimulation of the nerve, just sufficient to cause a gentle contraction of all the muscles with a prevalence of the adductors over the abductors, is much superior to that which the same cord shows during compression of the nerve. From this it is permissible to conclude that adduction is not caused by spastic contraction due to pressure, because if it were, the vocal cord ought to show an adductor force superior to that which is shown in the slight movements of expiratory adduction, and not inferior to it as really happens."

Naturally it may be objected that in pathological compression from tumors and the like, the pressure is exerted very much more gradually than is practicable in experiments, and that some chronic inflammation may set up in the nerve which may *possibly* cause stimulation and not paralysis.

Moreover, the objection of reasoning from animals to man, or from one animal to another, is always to be considered. I do not urge these objections for more than they are worth, but it is unscientific to disregard even the slightest rational objection.

It seems, therefore, that we are thrown back again upon that very vague and unsatisfactory law laid down by Rosenbach and Semon, that there is a specific vulnerability in the nerve fibres supplying the posticus muscle. This, I must confess, seems very unsatisfactory because it is difficult of conception, and, as far as I know, without analogy elsewhere in nervous pathology. Of course, it is quite possible, in view of the conflicting experimental evidence, that the median position may be due to either cause.

In reading the literature of the subject I have been impressed with the belief that at least one point has been overlooked or not duly considered, viz.: In any case of median position of the vocal cords due to spastic contraction, practical paralysis of the posticus muscle must ultimately occur, for the inability of its fibres to effectively contract must soon cause muscular atony. After a comparatively short time, also, we must expect fixation of the joint, so that any subsequent atony of the adductors, or any subsequent complete annihilation of the function of the recurrent, will not result in the cord assuming the cadaveric position, as occurs where the injury to the nerve causes more prompt destruction of complete function.

Lately, this belief, founded upon experience elsewhere in the paralysis of joints, has been confirmed by the report of a case[9] in which, there being double posticus paralysis with dypsnœa, one recurrent laryngeal nerve was divided, with the idea that this would produce complete paralysis of the laryngeal muscles on one side, which would place that vocal cord in the cadaveric position and so allow room enough for respiration. To the surprise of every one, no change occurred after the operation. Although the reporter offered no explanation, the one above suggested seems to me extremely probable.

Hence, in such a case as here reported, I believe that extirpation of the vocal cords would be a justifiable operation. It is one which has been satisfactorily performed in horses for "roaring," although the results have not been uniformly successful in regard to future service. The operation in the human patient, however, would be for the preservation of life without the discomfort and danger of wearing permanently a tracheotomy or an intubation tube.[10]

Discussion.

Dr. G. V. Wadlen, Indianapolis, in opening this discussion, expressed his pleasure in witnessing the tendency in the papers and current writings to accept the doctrine that there was no such thing as an organ or tonsil, having placed himself on record several years ago that there was no such thing anatomically speaking. He only wished to call attention to the causation and treatment of these growths, and their frequent diseased manifestations. Believing as he does that the catarrhal process originates always in childhood, and recognizing the poisonous nature of the secretion as taught in these papers he finds the reason for the fauces and especially the side of the fauces over which these secretions flowed to exhibit trouble was that nasal discharges are directed to these localities by the prominence of the posterior of soft palate. Therefore there being no such thing as a healthy tonsil, they show these various tendencies to disease and should be eradicated, and never by cauterization if it is possible otherwise.

Dr. Seiss, Philadelphia, thinks tonsils are definite physiological entities, as the glands occur in the lower animals, which never suffer from non-traumatic tonsillar enlargement. Denied that tonsils treated by galvano-puncture are apt to give subsequent trouble. Has seen many cases cured by this treatment. False membrane depends on intensity of irritant, occurs from steam scalds, the poison of influenza, etc. Pathogenic bacteria vary in malignant fever, and Jacobi taught years ago that a simple "follicular tonsillitis" may in another case set up "malignant diphtheria."

Dr. Jonathan Wright remarked:—There certainly are anatomical structures in the normal throat constantly from which the tonsillar hypertrophy follows. They are the folds of the mucous membrane supplied by a collection of mucipparous glands. In these folds of mucous membrane there are lymphoid follicles, collections of round cells from which the tonsil afterwards grows.

Bayinsky, of Berlin, and Coucetti, in Italy, have lately demonstrated the Loeffler bacillus in the cases of nonsystemic croupous rhinitis. I am at sea in regard to the diagnosis between malignant (diphtheretic) and benign croupous rhinitis.

DOMESTIC CORRESPONDENCE.

To the Editor of the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION:

It is well established that the United States has within her borders many valuable and potent mineral springs; and every careful physician should endeavor to recall his experience and investigations with reference to the climate and medical typography and the therapeutic value of the mineral waters of his locality. With the desire to add my mite to this important subject—the therapeutical value of the mineral waters of our country, I respectfully submit the following:

PRACTICAL OBSERVATIONS ON THE MEDICINAL PROPERTIES OF THE MINERAL WATER OF COOPER'S WELL, HINDS CO., MISS.

In the month of September, 1892, I derived substantial benefit from the pure and bracing air, at an elevation of about 650 feet above the level of the sea, and the medicinal properties of the mineral water of Cooper's Well, Mississippi, after a prolonged illness in New Orleans, La.

The mineral water of Cooper's Well (situated about the geographical center of the State of Mississippi) is prompt and decided in its therapeutical effects, which may be

[9] "Observation pour servir a l Étude de la Stenose laryngée néuropathique"—par le Dr. Albert Ruault, Archives lubrucations de laryngologie, No. 1, 1892.

[10] I do not wish to offer this suggestion without stating that I have made no search in literature for any similar previous suggestion or even trial. A record of both, therefore, may exist.

classified as 1. Purgative; 2. Diuretic; 3. Diaphoretic; 4. Tonic Alterative and Restorative.

1. *The Purgative effects* are due chiefly to *magnesium sulphate* (Epsom salts, about 24 grains per gallon); *Sodium sulphate*, (Glaubers salt, about 15 grains per gallon); and *Calcium sulphate* (about 32 grains per gallon).

2. *The Diaphoretic effects* are due mainly to the peculiar salts and to the *potassium sulphate* (about 6 grains to the gallon), *sodium chloride* (about 9 grains to the gallon); *Calcium chloride* (about 5 grains to the gallon); and *Magnesium chloride* (about 3½ grains per gallon of the water).

3. *The Diuretic effects* of the water must be referred to the action of the preceding salts upon the sudorific glands of the skin.

4. *The Alterative Tonic and Restorative effects* must be referred to, *a*. The peroxide of iron; *b*. The salts of calcium. And to the alterative effects of the salts of magnesium, sodium and potassium.

The combined effects of the saline ingredients, amounting to about 106 grains to the gallon (about one-fourth of an ounce per gallon), are manifest in the dark green copious evacuations from the bowels, the frequent and abundant excretions from the kidneys.

Both the liver and the kidneys are freely acted upon by the water, and at the same time the noxious abnormal products of the bile, torpid liver and deranged functions of the spleen, of the diseased and altered blood are eliminated by the gastro-intestinal mucous membrane.

The water of Cooper's Well, according to my personal observation and investigation, *will when used* under and by the direction of skilful physicians, prove highly beneficial in the following diseased states.

1. Anasarcan. 2. Ascites. 3. Alcoholism, acute. 4. Alcoholism, chronic. 5. Bright's disease. 6. Cardiac dropsy (valvular disease of heart). 7. Hepatic dropsy, arising from chronic hepatitis. 8. Renal dropsy, arising from lesions of kidneys. 9. Calculus (uric acid and oxalates and urates). 10. Jaundice, arising from hepatic derangements. 11. Jaundice, arising from the prolonged action of the malarial poison in the liver, spleen and blood. 12. Gout. 13. Rheumatic gout. 14. chronic malarial poisoning. 15 Rheumatism, chronic. 16. Diarrhœa, chronic. 17. Constipation, chronic. 18. Dyspepsia. 19. Nervous exhaustion, arising from various causes, as the prolonged action of febrile poisons, especially of the malarial poison; prolonged mental exertion, the prolonged heat of summer, the abuse of alcoholic stimulants and narcotics.

This water is contra-indicated in the *secondary diarrhœa* of *phthisis*, and in fact this disease (*consumption*) is not benefited, but rather injuriously affected by Cooper's Well water. However, phthisical patients may derive benefit from the elevation, cool climate, and pure, bracing air, and exercise over the beautiful hills and ravines, covered with lofty *long leaf pines*.—Respectfully yours,

JOSEPH JONES, M.D., LL.D.
Prof. Chemistry and Clinical Medicine,
Tulane University of Louisiana.

156 Washington Ave., New Orleans, Sept. 25, 1892.

BOOK REVIEWS.

A TEXT BOOK OF MORBID HISTOLOGY FOR STUDENTS AND PRACTITIONERS. By RUBERT BOYCE, M.D., with 130 colored illustrations. New York: D. Appleton & Co. 1892.

In this very excellent work the author without unnecessary verbiage gives a good account of the chief histological changes met with in disease. The arrangement of the subject matter is according to the method adopted by Prof. Horsley. The illustrations are micro-photographs, and are exceptional as reproductions of the histologists' work of the author and others. As an aid to those who assist the every day general practitioner in making accurate diagnosis of obscure diseases, this book is at once indispensable. For the student it is full of object lessons.

A PRACTICAL TREATISE ON DISEASES OF THE SKIN. By JOHN V. SHOEMAKER, A.M., M.D., Philadelphia. D. Appleton & Co., New York.

To those who know Dr. Shoemaker it is by no means surprising that this work upon diseases of the skin should be by far the most excellent that has yet appeared in America. It is fully up to date, well illustrated, and from a therapeutical standpoint is certainly irreproachable. Some of the pathological points are somewhat open to criticism, but not sufficiently so to detract greatly from the merit of the work. To the student of dermatology as a specialty, as well as to the general practitioner, this work will prove of great value.

GENITO-URINARY AND VENEREAL DISEASES. CHETWOOD.

This little volume is one of the students' quiz series in process of publication by Lea Brothers & Co. It is perhaps likely to be useful to the student during the cramming process preceding examination, but it is very apt to lead him into serious error if he remembers much of its teachings after entering practice. Quiz compends should contain few dogmatic assertions; this one is full of them. The statement is made, for example, that total extirpation of the involved glands prior to suppuration in chancroidal bubo, is not apt to prove successfnl. On the contrary, when properly done, it is quite often successful.

Another point worthy of attention is the absolute and unequivocal condemnation of the electrical treatment of stricture. There is a tendency to follow arbitrarily the teachings of Keyes. It may not be known to the author, but there are other authorities on genito-urinary diseases whose work is quite as reliable as that of the gentleman mentioned. Leaving out of the question the element of dogmatism, which is so paramount in this work, it is really an excellent little volume for the purpose for which it was designed.

OFFICIAL DISINFECTION SCIENTIFICALLY DIRECTED.—The medical profession has not a very lively admiration for the ordinary official disinfection and fumigation. While we do not, as a general rule, care to antagonize those operations, in the feeling that "they may possibly do some good"; neither do we care to very emphatically endorse them as matters of prime importance; we have become mildly agnostic in the matter. And this is chiefly because our rulers have seldom made provision that those official functions shall be under medical supervisions. Those acts have too often been done in a perfunctory manner.

The New York City officials have made a new departure, in those matters, that may serve to commend them again to medical confidence—after having driven it from them along with such men as Jacobi, Stephen Smith, Prudden, Janeway and many others. The Health Board has placed an expert bacteriologist in command of the disinfecting corps, and ten physicians will be employed under him, each of them having the oversight of a given district. Formerly the disinfecting was performed by laymen, sixteen or more in number. Dr. Herman M. Biggs, of the Carnegie Laboratory, will be the commandant of the somewhat fancifully entitled "division of pathology, bacteriology and disinfection"; and he will be known as the "bacteriologist-in-chief" with a salary of $3,000 per annum, or until some politician can put him out, after the cholera season is over. However that may be, the measure must be regarded as a wise one, and the appointment of Dr. Biggs as being in the interest of the public health. It gives dignity and prominence to official preventive work, elevating the "pot of brimstone" of the health officer to the position of a scientific symbol.

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SATURDAY, OCTOBER 8, 1892.

PROTECTIVE INOCULATION AGAINST CHOLERA.

The recent appearance of epidemic cholera in some parts of Europe has caused the publication, in various Continental medical journals, of many articles on the subject of acquired immunity to cholera as a result of protective inoculation of the ptomaine produced by the cholera vibrio. The subject is one of great interest in view of the high mortality of cholera, as well as the probability that this fall will not witness the extermination of the disease in Europe, and the spring of 1893 may, as has occurred in past epidemics, witness a renaissance of the present epidemic, that we are now informed is dying out.

In 1885 DR. JAIME FERRAN presented a paper to the French Academy of Sciences, in which he reported the results of experiments that showed that cultures of the cholera vibrio, injected subcutaneously in animals in suitable doses, produced certain local phenomena and rendered the animal immune to more virulent cultures of the vibrio, that would rapidly kill an animal that was not so protected. Similar mild injections in man produced phenomena analogous to those observed in the animals, and he inferred that if the latter were protected by these injections the former would also be protected. Subsequently this bacteriologist announced that it was the toxic product of the vibrio that produced the effects he had reported, because injections of cultures of the cholera vibrio in which the microörganisms had been killed, produced the same results as the cultures he had first employed. And still later he obtained an alkaloid from cultures of cholera that produced when injected similar effects to those he first published. A culture of the dead vibrio conferred a tolerance that resisted the effects of the living bacillus, and well-known methods isolated from cultures of the latter a ptomaine that produced a similar tolerance.

During the cholera epidemic of 1885 in Spain, FERRAN inoculated many persons with the protective culture of the vibrio, and the statistics of cholera occurring among uninoculated persons were 76.95 per 1,000, with a mortality of 33.58, while among the inoculated the attacks were 12.69 per 1,000, and the deaths 3.41. His methods were investigated by scientific commissions from several countries; but some of these investigators, while acknowledging the efficacy of the inoculations, condemned FERRAN for keeping secret his methods of preparing his inoculating fluid.

In 1888 GAMALEIA reported to the Paris Academy of Medicine that he had obtained from cultures of the cholera vibrio a toxic substance that killed in certain doses, but in smaller doses rendered an animal immune to choleraic inoculations.

More recently KLEMPERER has rendered animals immune to cholera by treating them with modified cultures of the cholera vibrio. He modified his cultures by keeping them at high temperatures for some days, or by passing a constant electric current through them for some hours.

HAFFKINE has also published a method by which he increases the virulence of the vibrio so that it will produce in animals symptoms that are similar to those produced by the disease in man; though an interesting fact is mentioned by him, that the symptoms in the animals do not appear for a few days, and occasionally the period has extended to two months. Like FERRAN, he cultivates the vibrio in guinea-pigs, and injects cultures of the vibrio under the skin, causing just such local phenomena as FERRAN noted, and rendering the animal immune against inoculations of cholera made in any way whatever. He attenuates this virus and uses it for protective inoculations in animals and in man. In the latter the symptoms are similar to those observed in the inoculations made by FERRAN. With these inoculations also, a second does not produce the constitutional or local phenomena observed with the first; and it is inferred that as the animals remain immune to cholera, so does a man who has been inoculated.

The inoculations are not attended with any grave disturbance of health; they can be practiced on human beings with perfect safety; and by a subsequent subcutaneous injection it is always possible to determine whether the immunity conferred by the first injection has persisted.

All later observers have confirmed FERRAN'S original claim that the ptomaine produced by the cholera vibrio would, if administered to an animal in suitable doses, inhibit the subsequent production of cholera in that animal. So to him is due not only the credit of the discovery, but of applying it as a means of protection against cholera, and the statistics he published showed its efficacy for that purpose.

SCHOOL HOURS.

Among the many things of which the American people are justly proud, there is nothing that takes precedence of the public school system that is now quite general in almost, if not all, the States. In fact, the excellence of the common school is a valuable indicator of the moral and social status of any community. Hence, a belief is general, that a fair common school education for every boy and girl is the best possible preventive of vice, pauperism and crime.

With the spread of intelligence there is a consequent aggregation of people in cities and populous centres, and in the population centres the saying is trite that a disproportionate number of the leaders of enterprise, alike in commercial and professional pursuits is drawn from the men who received their early education in country schools.

The reason usually given for the country boy being able to overtake the one reared in a city, is, that he has had the benefit of unlimited out door exercise, which has developed him into a more hardy, enduring and robust man, all of which is no doubt true and is justly a prominent factor in the case, but another, and we regard it as a most important reason for his superior physical and mental development, is that the country school boy has had the benefit of better school hours. A sleep of nine or ten hours fits him for a hearty breakfast, home chores and three hours' study, the latter interrupted by a fifteen minute recess in which to take a run and in his own way relax and stretch his nerves and muscles. So that when the clock hands point to the noon hour he is downright hungry and ready to partake of a good wholesome picnic dinner, which he has brought with him from home.

This bounteous noon repast, seasoned with the sauce of repartee, takes from fifteen to twenty minutes of what seems to him to be the very best part of the day. The remainder of this noon hour is given up to play.

This noon hour, with its provident dinner, supplies the nutrient pabulum for recuperation and growth that more than aught else makes the muscle, nerve and bone which enables the country boy in later years to forge ahead of his fellow, whose studies during his school days have been a daily grind of five or six hours, almost wholly taken up with recitations, broken only by a fifteen or twenty minute recess, which is too frequently spent in efforts at catching up in some delinquent study.

After school recitation hours the city boy has dinner, or more properly a lunch all by himself. The indicator in his stomach has long since announced the hour, and not being gratified, a sense of listless weakness has taken the place of hunger, so that his eating is too frequently without relish. Then a little rest, not play, and he is at his books again, preparing for the morrow's recitations. Such is his round for five days in the week.

This method of feeding the developing boy and at the same time working him to the limit of his mental capacity is the stunting factor that in after life places him at a disadvantage with the noon fed boy of the country.

The adage that "an army marches and fights on its belly" is equally applicable to the growing boy and girl. They thrive and study best when their stomachs are fed the best, and this can only be accomplished by the noon feeding hour intermission, and a corresponding regulation of study and recitation hours.

This suggested change does not meet with the favor of teachers, mainly, we think, because it lengthens their limited working hours. This reason should have no weight whatever in the consideration of a subject of such vital importance as the one to which attention is directed.

QUARANTINE.

The fear of invasion by cholera has subsided and quarantine appliances to interior cities have been raised.

The disagreeable features of the latter were in many instances quite irritating and detrimental to commercial pursuits, but in almost all instances there was a good natured submission to the health authorities, which indicated a willingness to bear personal discomfort and inconvenience for the greater good that was to accrue to the public at large.

While the official authorities were in some cases criticised for apparent extravagance and harshness in their measures, the motive and purpose was so important as to be an apparent justification for the act. Commendable promptness was characteristic in every direction, and as a Nation we are to-day in a condition for congratulation that the menace which so seriously threatened our welfare has been so effectually stayed.

Some important lessons were learned by the people. First, that the science of medicine is alert and progressive, showing that it has, since the last visitation of cholera, discovered the method of infection by that disease, and also a rational means for its control.

Having made these discoveries and practically demonstrated their correctness, it will hereafter become an actually criminal act for any civilized government to permit of a spread of this highly infectious disease.

This occasion has taught that in order to an effectual protection of our American people, the National Government must assume the duties of coast, as well as interstate quarantine measures, and all State and

municipal methods must be subservient to the control of the Nation's government officials. Furthermore, the American people have had their eyes widely opened to the enormity of the pauperism, imbecility and crime that is being transported in bulk to our shores.

This iniquitous business cannot be stopped by States or municipalities, but like an effective quarantine must be in the hands of and controlled to the extent of indefinite suspension by the National Government.

In this connection the report of SURGEON J. B. HAMILTON, of the U. S. Marine Hospital Service, on the recent quarantine at New York, published in our current issue, contains matter of great interest and value.

We now know enough to know that hereafter Nations should be held responsible for the existence and spread of this destroying disease.

Cholera can be as effectually eradicated as smallpox or typhus fever. Let every member of the American Medical Association take it upon himself to see that the Member of Congress representing his district is thoroughly informed on this subject. There is no possibility of his knowing too much about the dangers of wholesale ship and fleet loads of immigrant paupers, imbeciles and criminals with their accompaniments, including cholera.

THE FALSITY OF NOSTRUM DEALING.—The *Positive Medicator*, June, has formulated the following conclusions as the result of a very full knowledge of the ways and means of the patent-medicine vendors:

1. They claim to be specifics, which they are not.
2. The consumer pays an excessive price for a secret preparation when, were its formula know, the same preparation could be prepared and sold by his druggist at a reasonable figure.
2. Simple remedies are clouded in secrecy and sold as valuable new discoveries, which they are not.
4. Nostrums interfere with legitimate pharmacy, and being sold by dry goods bazaars, rob the pharmacist of his right alone to compound simple remedies for simple ailments.
5. Their selling value depends not upon their merit, but entirely upon their being pushed by advertising, which advertising in the end the consumer has to pay for.
6. There is no question but that the manner of advertising many nostrums is injurious to the public good. Ignorant people with slight illnesses are made to believe that they are in dangerous conditions and frightened into buying and consuming stuff which may not at all be suited to their cases, and which they use at an excessive cost to their pocket-books and general health.

From the above statement it will be seen that it is practically impossible for the nostrum-maker to say a true word in any of his published statements.

One ingenious calculator has figured out the cost of production of a dollar bottle of advertised medicine, and he has found that the utmost of drug-value that the manufacturer can afford to deliver to the sick person is ten cents. In other words, ninety cents out of the dollar, paid by the consumer, are necessarily absorbed by the proprietor, the wholesale druggist, the local dealer and the newspapers and other channels of spreading the lying claims of the nostrum, before the deluded patient receives his dime's worth of noxious liquid. And doubtless it is better for the patient that he gets that small return for his dollar, the less he gets for his money the better off he will be.

ERRATA.—In the issue of September 17, page 335, the heading of S. C. Ayers' article should read "Embolism of the Central Artery, *or* Thrombosis?" instead of *a* thrombosis.

THE ESTABLISHMENT OF A NATIONAL QUARANTINE STATION NEAR NEW YORK HARBOR.

BY JOHN B. HAMILTON, M.D., LL.D.,
SURGEON U. S. MARINE-HOSPITAL SERVICE, FORMERLY SUPERVISING SURGEON-GENERAL M.-H. S.

THE JOURNAL has secured a copy of Dr. Hamilton's report on the construction of "Camp Low." It is interesting from a sanitary point of view as being a report of the first camp constructed in the United States for cholera suspects, and the rapidity with which the work was accomplished was itself a feat worthy of notice.

REVENUE MARINE STEAMER "U. S. GRANT,"
OFF CAMP LOW, NEW JERSEY,
SEPT. 20, 1892.

THE HON. CHARLES FOSTER,
SECRETARY OF THE TREASURY, WASHINGTON:

Sir.—I have the honor to report the establishment, according to your orders, of the National Quarantine Station, "Camp Low," on the government reservation at Sandy Hook.

RAISON D'ETRE.

The reason for the existence for this establishment was the presence in New York harbor of several vessels infected with Asiatic cholera, having on board a very large number of passengers exposed to the danger of infection, and for whom the provisions made by the health authorities of the State of New York were entirely inadequate. In particular, the passengers from the steamer "Normania," of the Hamburg-American line, were in quarantine for several days, and each day members of the crew were taken sick with cholera. These passengers being detained on board, were constantly subjected, on the one hand, to the terrors of Asiatic cholera, and the hardships of rigorous confinement on the other. Although detained in quarantine, these passengers, most of them American citizens, managed to communicate their unfortunate condition to the public; and American sympathy, always responsive to human suffering, was quick to heed. The Government undertook to supply the deficiencies of the local quarantine at New York, and by your direction I examined the New York quarantine stations at Hoffman's and Swinburne's Islands, and found that Hoffman's Island, the only station to which persons from infected vessels could be removed, was crowded with detained emigrants; that no more could be accommodated, and that no provisions whatever had been made for cabin passengers. More than ten thousand steerage from European ports infected with Asiatic cholera were either on their way or were booked for passage, and ships recently arrived had lost many on the voyage. Under the stress of this menace the Government had no alternative, and by your further direction, I next inquired what measures of precaution could be undertaken by the Government to aid the State of New York in what threatened to become one of the most calamitous years of the Republic, in averting the prospective invasion.

You placed the U. S. revenue steamer, "Grant," Capt. Thos. S. Smyth, at my disposal, and her officers rendered

most valuable coöperation. In examining New York Bay and vicinage, in company with Medical Director Gihon, U. S. Navy, and Dr. John H. Rauch, it was seen that Horse-shoe Cove, off Sandy Hook, afforded a perfect anchorage for vessels, and the land opposite being a Government reservation, and no important village or settlement near, afforded an eligible site on which to establish a quarantine camp, at once easy of access and easy to guard. Fortunately, the old wharf of the New Jersey Central R. R., on which was built a warehouse, was in an excellent state of preservation, and in such condition that it could be easily made the initial point for the new buildings, on which the location of the proposed camp can be seen.

THE CONSTRUCTION OF THE CAMP.

On Friday, Sept. 9, 1892, the steamer "Grant" anchored in Horse-shoe Cove, and with Lieut. Levis and the ship's carpenter, U. S. R. M., measurements of the wharf and buildings were taken. That evening you accepted the proposal of Mr. Austin Corbin, president of the Long Island Railroad, to build the necessary buildings according to my suggestions. That night I spent in writing memorandum requisitions for supplies, and the next morning a force of 150 carpenters, under the direction of Mr. C. M. Jacobs, C. E., and Mr. Cummings, were on the ground, and the buildings were erected with surprising rapidity. These comprised a large dining hall, with a capacity of seating 500 persons; a storeroom for the commissariat; a kitchen; three pavilions; a telegraph office; a baggage-room; a hospital; a laundry; a building for the dynamo; Surgeon Commandant's office; quarters for the correspondents. The railway tracks between the pavilions were of great use, not only in the construction of the Camp, but afterwards in its administrative functions. Over four hundred thousand feet of lumber were used in the construction of the buildings, and they were completed on Saturday morning, September 17.

The dimensions of the buildings were as follows:

Pavilion A	18x343 feet.
Apartments	South 47 feet.
	North 47 feet. Total, 94 rooms.
Pavilion B	13x313 feet.
Apartments	48 single.
Pavilion C	16x330 feet.
Apartments	South 44 feet.
	North 23 feet. Total, 63 rooms.
Making a total of 209 staterooms.	
Telegraph Office	13x25 feet.
Press Office	10x40 and kitchen 10x13 feet.
Laundry Building	13x64 feet.
Dining Hall	3 ix96 feet.
Electric Light Building	12x28 feet.
Baggage Room	36x60 feet.
Commissary Building	18x36 feet.
Pantry and Kitchen	27x35 ft.; extra kitchen, 12x23 ft.
Surgeon-Commandant's Room.	13x30 feet.

In addition to the foregoing there were 3,006 feet of sidewalk laid; 4 water closets made; 58 latrines built; 100 tent floors 12x14, and 200 tent floors 10x12 feet were made ready to be placed in position.

On Sunday, September 11, 400 wall tents, previously shipped by the War Department, were set up by the United States Artillery from Fort Hamilton by order of Maj. General O. O. Howard, and speedy provision was made for the early occupancy of the Camp.

After the rush of construction was over, a few carpenters were retained to extend the pavilions. By this means it was intended to do away with the necessity for many tents.

WATER SUPPLY.

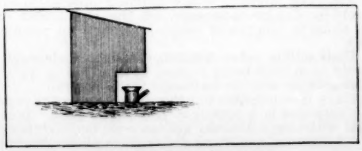
Abundance of fresh water is obtained on the Hook by driven well, and the old railway tank was utilized as a source of pressure, and water was piped to the various buildings.

MACHINERY.

Mr. Corbin caused the electric light plant formerly used at Rockaway Beach to be removed and put in position; and after the third night the work of construction was carried on at night by its aid. This has since been used for lighting the Camp. A steam pump was placed at the old tank house to keep up the supply of water in the tank, and another pump was placed near the dynamo on the wharf and supplied with 500 feet of hose, with sea water connection, to be used in case of fire. I made a contract with the Troy Laundry Co., of New York, to furnish and place in position ready for running, a laundry plant capable of washing for 500 persons a day. This machinery comprised stationary tubs, an engine, two washing machines, a centrifugal wringer, a mangle and drying racks. This was completed according to contract within forty-eight hours, by the men working night and day.

LATRINES.

In a Camp intended to contain suspects from ships infected with the Asiatic cholera, the construction of the latrines and their subsequent management are points of the first importance, for as is well known, the surveillance of persons suspected of cholera must include a watch of the frequency of their bowel movements. In the plan which was finally adopted, I availed myself of the advice of my friend, Lt. Col. Geo. M. Sternberg, Surgeon U. S. Army, and a delegation from a Committee of the New York Academy of Medicine, consisting of Drs. Loomis, Stephen Smith, Jacobi, Janeway and Allen McLane Hamilton. It was urged by Dr. Jacobi that the use of earth closets or chambers in the staterooms would make it impossible to ascertain quickly what person in the camp was suffering from diarrhœa, a point which only needed to be stated to be self-evident; therefore latrines were constructed in such a way that the dejecta was received into a pail, and the little houses themselves placed between the rows of corridors and tents in such a position that the patrolman could easily keep them under observation.



Section of Latrine, Camp Low.

Galvanized iron pails of a capacity of two gallons were provided to receive the dejecta, and milk of lime was ladled into these pails by the patrolmen, who were instructed to systematically inspect them while on their beat. At the same time they were instructed to report to office any person making the second trip to the latrine from his stateroom or tent. Other attendants were directed to mop the seats twice a day with bichloride of mercury solution.

HOSPITAL.

The hospital was constructed in more careful finish than the barracks and was intended for persons falling sick or being injured while in camp. Cholera patients, when found, were removed to and kept in tents near the hospital, and isolated from the remainder of the camp.

PATROL.

To prevent straying of the detained persons, the Honorable Secretary of the Navy, directed the detail of 211 marines under the command of Major Huntington, who drew a complete cordon sanitaire at a safe distance from the camp and maintained a regular patrol. This arduous duty, necessary for this temporary camp, which involved considerable hardship upon the officers and men of Major Huntington's command, could readily be obviated if the Government shall finally conclude to establish a permanent station, by the erection of a brick wall and the dredging of an inner moat.

SEA PATROL.

The sea patrol was a matter of much less difficulty, and, for the first few days, was performed by the steamer "Grant," Capt. Thos. S. Smyth, which officer also detailed Chief Engineer F. H. Pulsifer to aid in making his first purchases, and in various other ways aided in the construction of the camp. The Hon. B. F. Tracy, Secretary of the Navy, detailed the Monitor "Nantucket," Captain Book, with two steam launches to continue the sea patrol and relieve the "Grant."

THE EXECUTIVE FORCE.

At first I was the only officer, but when the Camp commenced to receive refugees turned over by the health officer of New York, the force consisted of myself as Surgeon-Commandant of the camp, Surgeon W. H. H. Hutton, M. H. S., Passed Assistant Surgeons Wasdin and Stoner, and Hospital Stewards Rœhrig and Stearns. At my earnest solicitation the veteran sanitarian John H. Rauch, M.D., consented to remain as sanitary adviser and cholera expert. The remainder of the force consisted of cooks, carpenters, one plumber, and about forty-five laborers. These were employed in continuing the barrack extension and policing the camp. At first we were short-handed and attempted the employment of refugees, but it was found that they could neither be kept at work nor could they be made efficient. Ten sailors uniformed were therefore engaged as an additional force and were employed exclusively in sanitary work. My experience has shown that sailors are better disciplined and can be kept on such duty much better than the ordinary laborers. Mr. Nimmo, an interpreter and medical student, was made the foreman of the disinfecting corps. It was from the first deemed necessary to have female attendants to look after the welfare of the female refugees, and perform such other duties as might be required of them, and Mrs. Dunkinson, of Geneva, New York, was given supervision of their duties. Surgeon Henry W. Sawtelle relieved Surgeon Hutton, and I turned over the command of the camp to him September 22, 1892.

AERATION.

It is well known that aeration is one of the most effective means of disinfection, and for that purpose 2,000 ft. of clothes line was placed in position to enable refugees to aerate their baggage.

SUPPLIES.

The first supplies for the camp were received by the New Jersey Central R. R., but the local health authorities of New Jersey threw such obstacles in the way of trains as to make it impossible to obtain supplies with regularity or certainty. The steam tug "Talisman," Capt. C. H. Winette, was chartered, to be entirely at the service of the commanding officer of the camp, and make such trips to New York City as should be deemed desirable. Lieut. Wm. J. Herring, U. S. R. M., of the Str. "Chandler," whose headquarters were near the barge office, kindly consented to purchase miscellaneous supplies, and this officer is entitled to the highest commendation for the faithfulness with which he performed this extra duty.

GENERAL.

Should the Government at any time take this for a permanent station, a wall directly across the Hook to the Atlantic, marking the east and west boundaries of the quarantine, would not only obviate the necessity of a military guard, but would allow persons detained to go through the cedar grove back of the camp, and thus add materially to their facilities for recreation while undergoing detention.

The barracks could be weatherboarded and plastered, and heated by steam when necessary. A crematory should be built in the vicinity of the hospital. No isolation ward is necessary, as tents with flies, properly floored and heated by stoves, are better managed than isolation wards, which with every precaution are likely to themselves become centers of infection.

It is obvious that the establishment of this camp met a necessity arising from the great number of immigrants from infected ports massed in the harbor of New York; without it great hardship and greater loss of life must have inevitably resulted, not only among the unfortunate immigrants but in cities and towns near by as well as those remote from New York. The officers engaged in the work have entered upon it with great public spirit, fully imbued with the intention, at whatever risk to themselves, to spare no effort in protecting the country against a great calamity, and I am safe in predicting the final report of the Surgeon-Commandant will show the superiority of National methods in which the whole country have an interested voice, over those which formerly obtained.

There is no question of the power of Congress to legislate in the matter of National quarantines, and it is no argument against the exercise of that power to show that heretofore Congress has only undertaken to supply the deficiencies of State quarantines. Congress has not formally relinquished its power, nor could it do so; it has only failed to use it. When a fringe of States along the Atlantic seaboard comprised almost the whole of the United States, the necessities were different from the present conditions, when the center of population has been removed to the Mississippi Valley. It is inconceivable that one State alone should continue to conduct protective measures, according to its own methods, without regard to the wishes of other States, when all have common interests and are mutually interdependent.

But even more than economical considerations or convenient administration is the great relief to those poor suffering people, huddled together on a ship lying at anchor. They have nothing to fear more deadly than the fatal "crowd poison." Close quarters at sea may be made endurable by the forced ventilation, but lying at anchor the steerage air soon becomes stagnant and poisonous.

I am, sir, very respectfully, your obedient servant,

JOHN B. HAMILTON,
Surgeon U. S. M. H. S.

THE COURT of Appeals of Kentucky has recently decided that syphilis, pleaded in answer to an action to recover damages for breach of promise of marriage, is a complete defence, following the decision of the Supreme Court of the State of North Carolina, in which the same defence was interposed and sustained in a similar action.—*Weekly Medical Review.*

DR. JENKINS, health officer at New York, and Dr. Wm. Randle, surgeon of the port of Philadelphia, are both from Mississippi.

SELECTIONS.

THE CONICAL CORKY SPINES OF ZANTHOXYLUM.—The "Annals of Botany" for July contains an interesting paper by Mr. C. A. Barber, B.A. (Superintendent of the Agricultural Department of the Leeward Islands), on the corky spines of *Zanthoxylum*. The author traces the development of the corky spines of *Z.alatum*, as observed in fresh material supplied by the authorities at Kew. The corky cone appears to rise first as a sort of cushion beneath the thorn. In the earliest stage of its growth it is assisted by a lysigenous gland, which is found at its base. The tissue of this gland is differentiated by the formation of a small area of cells with granular contents, around which the neighboring cells become arranged concentrically, and the number of cells between the vascular ring and the epidermis becomes increased. In a more advanced stage, the cells on each side of the gland become collenchymatous, and the thorn becomes prominent, its cells elongating in the direction of its length. The cells outside the collenchyma then divide and form a meristematic layer at the base of the thorn, the cells nearer its apex becoming rapidly elongated, pitted and thick-walled. The change takes place more rapidly at the surface of the thorn, so that a hard tissue is formed around a softer core.

In the autumn the meristematic cells become sharply marked off from the underlying cells of the cortex, and are much shorter and more closely packed than before, assuming and retaining a brick-shaped character, rapidly taking the appearance of corky tissue, and exhibiting rings of growth in the stem of *Pinus*. By the rapid increase of growth of the lower part of the thorn, after the capacity for growth in the epidermal cells has diminished, the tissues around the base of the thorn are ruptured by the tension, and the corky cushion of the thorn becomes evident. The hardened or upper portion of the thorn soon shows at its base a line of separation, caused by a difference of form and the manner of thickening of the cells in its upper and lower part. A split across the top of the cushion and between it and the base of the spiny portion is thus formed. The latter ultimately separates from its corky base and leaves a scar, or causes a truncated appearance on the top of the corky cushion. In rare cases the spiny portion or part of it may still be seen adhering to the top of the corky cushion. Mr. Barber appends to his paper a list of plants, the thorns of which have basal cork formation. This list includes plants belonging to the *Malvaceæ*, *Rutaceæ*, *Simarubeæ*, *Rhamnaceæ*, *Leguminosæ*, *Rosaceæ*, *Araliaceæ*, *Cactaceæ*, and *Euphorbiaceæ*.—*Phar. Jour. and Trans.*, Aug. 6, 1892, p. 108.

MISCELLANY.

AT THE recent meeting of the American Orthopedic Association the following officers were elected to serve for the ensuing year: President—Dr. A. J. Steele, St. Louis; Vice-Presidents—Dr. Samuel Ketch, New York; Dr. Arthur J. Gillette, St. Paul; Treasurer—Dr. A. B. Judson, New York; Secretary—Dr. John Ridlon, 34 Washington St., Chicago.

DR. W. S. CHRISTOPHER, Professor of Diseases of Children in the Chicago Policlinic, has also been appointed Professor of Diseases of Children in the College of Physicians and Surgeons of Chicago.

DR. W. C. WILE, editor of the *New England Medical Monthly*, was elected Surgeon-General of the Grand Army of the Republic at the annual encampment of that organization in Washington in September.

MEETING OF INTERNATIONAL MEDICAL CONGRESS (American Public Health Association), in the City of Mexico, November 29th and 30th and December 1st and 2nd, 1892. For the convenience of delegates, and all physicians with their families, who desire to attend this meeting, an elegant Pullman car will leave Chicago November 19th. Short stops will be made at all points of interest between Chicago and the City of Mexico. For further information, maps, time tables, etc., address John E. Ennis, D. P. A., Mo. Pac. Ry., 199 Clark street, Chicago, Ill.

OFFICIAL LIST OF CHANGES in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from September 24, 1892, to September 30, 1892.

Capt. William Stephenson, Asst. Surgeon U. S. A., is relieved from duty at Ft. Porter, N. Y., and ordered to Boise Bks., Idaho.

Capt. Eugene L. Swift, Asst. Surgeon U. S. A., promoted Captain, to date from August 12, 1892.

First Lieut. S. R. Dunlop, Asst. Surgeon U. S. A., is granted leave of absence for one month, with permission to apply for an extension of one month. Par. 2, S. O. 99, Hdqrs. Dept. of Texas, San Antonio, Tex., September 20, 1892.

First Lieut. Wm. F. Lippit, Asst. Surgeon, will proceed from Camp Eagle Pass to Camp Pena Colorado, Tex., and report to the commanding officer for temporary duty. Par. 3, S. O. 29, Hdqrs. Dept. of Texas, San Antonio, Texas, September 20, 1892.

OFFICIAL LIST OF CHANGES of Stations and Duties of Medical Officers of the U. S. Marine-Hospital Service, for the Five Weeks Ending September 24, 1892.

Surgeon W. H. H. Hutton, to proceed to Cape Charles Quarantine for special duty. August 27, 1892. To proceed to Sandy Hook, N. J., for special duty, September 10, 1892. Relieved September 16, 1892.

Surgeon John B. Hamilton, to report in Washington, D. C., for special temporary duty. September 2, 1892.

Surgeon H. W. Sawtelle, detached for special duty as quarantine inspector, Canadian frontier, September 5, 1892. To proceed to Sandy Hook, N. J., for special duty. September 16, 1892.

Surgeon G. W. Stoner, detailed for special duty as quarantine inspector, Michigan ports. September 3, 1892.

Surgeon F. W. Mead, to proceed to Baltimore, Md., on special duty. September 24, 1892.

P. A. Surgeon C. E. Banks, to proceed to Washington, D. C., for special duty, August 26, 1892. To rejoin station September 8, 1892. To proceed to Washington. D. C., for special duty, September 22, 1892.

P. A. Surgeon S. C. Devan, to proceed to Delaware Breakwater Quarantine for special duty, August 28, 1892.

P. A. Surgeon P. C. Kalloch, to proceed to Portland, Me., for temporary duty, August 26, 1892. Detailed for special duty as quarantine inspector Maine ports, September 8, 1892. To proceed to Washington, D. C., for special duty, September 15, 1892. To proceed to Portland, Me., for temporary duty. September 22, 1892.

P. A. Surgeon Eugene Wasdin, to proceed to Sandy Hook, N. J., for special duty, September 13, 1892.

P. A. Surgeon J H. White, to proceed to Way Cross, Ga., for special duty. September 19, 1892.

P. A. Surgeon J. J. Kinyoun, to proceed to Baltimore, Md., on special duty, August 27, 1892. To proceed to Philadelphia, Pa., on special duty, September 1892. To proceed to New York, N. Y., on special duty. September 21, 1892.

P. A. Surgeon J. O. Cobb, to proceed to Sandy Hook, N. J., for special duty. September 19, 1892.

P. A. Surgeon J. B. Stoner, to proceed to Sandy Hook, N. J., for special duty. September 13, 1892.

P. A. Surgeon C. P. Wertenbaker, to rejoin station (Chicago), August 28, 1892.

Asst. Surgeon J. C. Perry, to proceed to Norfolk, Va., for temporary duty, August 27, 1892. To proceed to Cape Charles Quarantine for special duty. September 8, 1892.

Asst. Surgeon W. G. Stimpson, to proceed to Delaware Breakwater Quarantine for special duty. September 2, 1892.

Asst. Surgeon A. J. Rosenau, to proceed to Cape Charles Quarantine for special duty. September 10, 1892.

Asst. Surgeon L. E. Cofer, granted leave of absence for sixty days on account of sickness. September 2, 1892.

Asst. Surgeon W. J. S. Stewart, to proceed to Charleston, S. C., for temporary duty, August 26, 1892. To rejoin station (New York), September 2, 1892.

Asst. Surgeon Edgar Strayer, assigned to temporary duty at Boston, Mass., September 6, 1892.

PROMOTIONS.

Geddings, H. D., commissioned as P. A. Surgeon September 2, 1892.

Wertenbaker, C. P., commissioned as P. A. Surgeon September 2, 1892.

APPOINTMENT.

Strayer, Edgar, M.D., of Pennsylvania, commissioned as Asst. Surgeon September 2, 1892.